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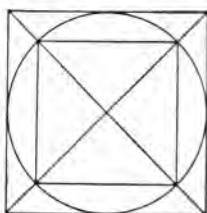
The magazine in English, German and French for applied medium- and large-format-photography.

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## Cover:

If the photographer really takes the trouble to carefully focus the image on the ground glass screen of his large-format camera with the aid of a magnifier and also pays appropriate attention to well-balanced lighting of the colours, he will obtain from the 5 × 7 in. format a richness of detail and colour saturation which cannot be paralleled. This sectional enlargement from a 5 × 7 in. Agfachrome 50 S transparency proves the point. Photo: Charles Compère, Opladen, 5 × 7 in. Linhof Kardan Color, 210 mm Schneider Symmar, 1/60 sec. at f 16.

Photo: Erich Sommer.



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# *Is this photography— or expecting too much?*

More or less all magazines and books on photography published either in Germany or abroad usually find their way on to my desk at some time or other. On thumbing through quite a number of them I am obliged to ask myself what the point of some of the photos is. These "interesting-at-any-price" pictures have often little to do with photography in its legitimate sense.

This "disease" started actually in a respectable photographic magazine which was generally regarded, on the one hand, as being a trend-setter for novel ideas but also retained a conservative style on the other hand.

Our readers will probably remember how, a few years ago, pictures began to appear showing dolls with torn-off limbs and other refuse from the local rubbish dump. This "new line" in photography was soon adopted by a series of other plagiarist magazines and given the full works. At that time there were few who asked themselves about the Why and Wherefore behind this trend. The fact that the originals were merely illustrative photos taken for a specific advertising purpose was noticed by hardly anyone.

At any rate, this thoughtless adoption of any and every form of nonsense has finally led us today to a state of affairs which can only be described as intolerable. Many photographic magazines are at present publishing pictures which any normally-adjusted amateur who has just taken up photography as a hobby is bound to regard as sheer scrap and which he would be ashamed to show even to his friends.

The whole affair would actually not be so regrettable, since any new trend, which proved shortly to be nothing but a craze, has burnt itself out soon enough. There is, however, a further aspect which ought to give all of us fruit for thought. These very pictures are unfortunately blindly copied, just as they have been

presented by the editor, by a large number of amateurs and even a few professionals. It is not a difficult matter to back up this statement with evidence. Those who are not convinced should do as I did and ask a camera dealer what the average amateur tends to photograph. One can exclude, for the present, only those photos which were shot to remind one of a holiday or some family celebration.

The results of such an enquiry are really rather horrifying!

The choice of motif, camera angle, illumination and the photo-technical shortcomings have all been borrowed from this repelling kind of pseudo-photography in which the latest gag is to squeeze, somehow or other, every subject which would normally call for a vertical format into a horizontal format and vice-versa.

True, life is not a bed of roses but, on the other hand, it is nothing like as grey as these pessimistic-minded photographers depict in the majority of their pictures. It would appear that nothing remains in our present-day world to delight the eye—nothing beautiful to admire. One could easily incline to this opinion when confronted day by day with nothing but these dreary, desolate images, showing only tumbled-down shacks, squalor and humanity in the most sordid and barely recognizable state. One thing is certain: the explanation one is usually offered—that it is essential to show reality just as it is—is quite beside the mark. Here we are not dealing with the objective documentation of a camera journalist who wishes to convey, through his photos, a naturalistic and faithful impression of a particular event. No, this photographic nonsense is even parading as "art". Provided with an appropriate framework and grand title, it is offered for sale as "modern photographic art". The only "art" involved here is the skill in promoting these works, either direct

selling or the presentation in one of the magazines concerned with the publication of such wares. Is it not about time that this pointless kind of "photography" which serves no one and yet misleads so many, came to a close? Editor

The nude in nature—a theme to which photographers constantly return. Here, Paul Genest has shot a picture which does justice to the character of the countryside as well as the model; it was just the right girl for the Camargue.

Data: Linhof 220, Agfacolour 80 S enlarged on to Agfacolor MCN 311 photo paper.







**LINHOF TECHNORAMA**



The new Linhof wide-angle camera has, in spite of the ultrabroad format of 56×170 mm (2¼×6¾ in. = ratio of 1:3), modest and pleasing dimensions. Once again Linhof has given careful consideration to design. The housing appears almost dainty, since any unnecessary ballast has been got rid of. The workmanship really deserves the title "Made in Germany".



# PANORAMIC SHOOTING ON ROLL FILM

A feature particularly worth noting is the specially developed optical viewfinder which virtually does show everything which will appear on the film later, and with great exactitude. Simple, trouble-free operation remained the uppermost thought. For example, the shutter release has been incorporated into the housing although the cheaper solution would have been to just lay a cable release outside.

The choice and integration of the lens has likewise received careful attention. The Schneider 90 mm f 5.6 Super Angulon affords a very wide angle of view and, since it was computed for the 5×7 in. format, it has excellent overall sharpness in view of the fact that only a part of the very large circle of definition is utilized. The camera may be loaded with either 120 or 220 roll film from which one then obtains either four or eight exposures in the special format 56×170 mm.

*There must be very few photographers who, at some time or other, have stood frustrated in front of an elongated subject and not known how to get it all onto film in the way wanted. Lack of space to move back and a motif which is either too high or too broad is the problem one is faced with here. One longs for some special, super-wide-angle camera with which one can still take in, for example, the conference participants sitting at the extreme ends of a wide table, the vast space of the Camargue or, in the other direction, the enormous height of the new television tower. Unfortunately, we have all waited a long time for such a camera.*

*Now the dream has become reality: the hand-held Linhof Technorama, with picture quality in the 5 × 7 inch format, is here:*

The original conception of this camera dates back many years. Even in those days it was possible, with the aid of a special film holder which permitted two consecutive exposures on a sheet of 5 × 7 inch film, to shoot "cinemascope-type" pictures. One used the medium-wide-angle lens from a 4 × 5 inch camera which just about covered the broad format. Of course such a way of going about the problem was timeconsuming and meant focusing on the ground glass screen. In

The original format of the Linhof Technorama 6×17 cm

Colour page left:

The Linhof-Photographer made some colour pictures on roll film with the first prototype of the camera Linhof Technorama. The results are very interesting!



# LINHOF TECHNORAMA

order to make this fascinating format, with its manifold possibilities, a practical proposition, a special camera had to be designed: the Linhof Technorama.

The visually impressive super-broad format and the camera's ultra-wide angle lens permit one to still take photographs when others have packed their cameras away long ago. Using conventional 120 or 220 roll film, the Technorama takes four, resp. eight exposures  $56 \times 170$  mm in size and does so without distorting even the extremities of the broadest subject.

This feat is largely due to the very great circle of definition of the permanently-mounted wide-angle lens which also exhibits extraordinarily good edge sharpness. With a focal length of only 90 mm the depth of field is generous. The precision optical viewfinder, which has a built-in spirit level, shows the exact field taken in and facilitates leveling off the camera.

Such mouth-watering possibilities are backed up by pleasantly designed appearance and surprisingly simple operation of the new Linhof Technorama  $6 \times 17$  its hand-held capability being the greatest plus point of all!

Time and again the finished results simply fascinate: broad, sweeping pictures taken from angles which were previously impossible on roll film and in a perspective and quality the likes of which we have never really been seen before. So diverse are the applications throughout the entire domain of photography that it is difficult to name all of the possibilities inherent in this camera.

Anyone who sets off in search of motifs armed with the Linhof Technorama  $6 \times 17$  will very soon realize that it is admirably suited to quite a variety of tasks. No matter whether one takes it along to a press assignment, on an expedition or uses it for architecture, industry or sport, the new Technorama will prove surprisingly versatile.

Short exposure times permit live snapshots with panoramic vision. To obtain such elongated pictures previously it was necessary to scan a stationary subject with a tripod-supported camera taking successive exposures and then paste up the prints together later.

The Linhof Technorama  $6 \times 17$  has already proved to be most useful in all those fields of modern professional photography where one wants to shoot impressive action pictures of unusually wide perspective under very cramped quarters either indoors or outdoors. Those working in the field of advertising will find in the Linhof Technorama a most creative tool for a type of photography which was only formerly possible with back or front projection in the studio: the panorama shot with full-size, live actors in the foreground and perfect sharpness right into the depths of the background.

The Linhof Technorama  $6 \times 17$  will enable architectural photographers to obtain distortion-free panoramic views without converging verticals, curved horizon or the need to use a tripod or camera movements.

The press photographer and camera journalist will find in the Linhof Technorama an apparatus with the aid of which he will often, under critical and difficult circumstances, be "one up" on his colleagues. Owing to the enormous recording capacity of the long format, the reporter is in a position to capture unique moments without having to jostle with his fellow-newsmen: from an apparently ridiculous stand point he gets more onto his film than the others.

## Technical specification:

*Taking format:*  $56 \times 172$  mm for 4 or 8 exposures on 120, resp., 220 roll film

*Lens:* 90 mm f 5.6 Schneider Super Angulon

*Shutter:* Compur 1 sec. to  $\frac{1}{500}$  + B, f-stops 5.6 to 45 flash synch. contact

*Focusing:* helical thread, from 1.5 m/4.9 ft. to infin.

*Fittings/extras:* Shutter release on housing, socket for cable release, viewfinder shoe with hot flash contact, film advance lock, exposure counter

*Viewfinder:* Special optical finder with reflected spirit level, eyepiece correction lenses

*Dimensions:*  $265 \times 170 \times 110$  mm (with viewfinder 150 mm)

*Weight:* 2185 g

Notice

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One section of our Art and Antiques auction to be held next April will comprise photographic articles (old cameras, literature, old photographs).

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*Page 10 and 11:*

Although the Galapagos Islands are located exactly on the equator, one finds here, apart from the expected tropical species, also a number of originally polar animals. The Humboldt Current from the Antarctic Ocean carried two kinds of seal as well as penguins to the north. One group ventured as far as the Galapagos, settled there and developed into the Galapagos penguin—as shown here—which breeds just south of the equator and is thus the northernmost form of all kinds of penguin.

# GALAPAGOS

*Archipelago of rare animals  
and weird landscapes*





## Photo report

The Hallwag Verlag, Bern and Stuttgart, published a remarkable picture-book in 1975 which we have already introduced to our readers. The illustrations in this book are so convincing and of such excellent photographic quality that we have decided to show our readers a few more examples from this work. Those interested in virgin nature—and we are thinking here particularly of the ornithologists—will draw great pleasure from this book. The archipelago “Galapagos” lies on the equator some distance off the west coast of South America. It belongs politically to the State of Ecuador. Its numerous islands, which are of great geological variety, have now been officially declared to be a National Park in the hope that the flora and fauna of this region may be protected, to some extent, from the ravages of civilization. In spite of these measures, this most unique “natural museum in the world” is, indeed, suffering from interference, and some species are even threatened with extinction at the hands of ruthless hunters and tourists. For photographers the islands represent, undeniably, an inexhaustible source of motifs. The illustrations in the Hallwag book are sufficient evidence of this.

Page 12:

One of the bizarre aspects of the archipelago: solidified lava formed into a “moonscape” which is inhabited, principally, by an unpoisonous species of snake “dromunius viper”.















*Page 13:*

This snow-white heron, egretta alba, is to be found in practically all tropical and temperate zones of the earth. Since the feathers of the bird were highly coveted around the turn of the century (they were worth twice their weight in gold), they are still rare also on the Galapagos.

*Page 14 top left and bottom:*

In the otherwise sparse flora of the Galapagos, the beautiful orchid-like blossoms of the robinia, which is related to the acacia, create a welcome contrast. The adjacent picture shows the fruit capsule of a wild cucumber.

*Page 15:*

Green iguana. The larger species can reach a length of 7 ft.













# MUSÉE FRANÇAIS DE LA

The occasion for this retrospective contribution is the official appointment of the founder of the Photo Cine Club du Val de Bièvres, Jean Fage, to the post of curator of the French Museum of Photography in Bièvres near Paris. The history of this museum, which is likewise the background story to the successful Photo Club in Bièvres, is told by the President of the Club and the Photo Museum himself.

"In a small, picturesque village about six miles south of Paris five photographers began meeting in 1949 in order to discuss their own ideas and common problems. This was, so to speak, the "core" or our future 'Club du Val de Bièvre'.

Through a series of coincidences it was possible to attract the support of a number of other photographers of repute. After four years of turbulent but interesting work we had succeeded in founding the largest group of leading amateur and commercial photographers in France.

We have never attempted to set the fashion or lay down principles as some of our members would like to have seen. It was our chief aim to grant each individual member the freedom to express himself in his own style and to respect his creative urge. Nevertheless, our Club has, in fact, set examples in quite a number of fields of photography. Present-day French photography has been recognizably fashioned, in an overall respect, by our way of thinking.

Many famous photographers have helped us in a number of ways. Amongst others they include: Man Ray, Emmanuel Sougez, Lucien Lorelle, Daniel Masclet, Brassai Izis, Craven, Doisneau, Boubat, Almasy, and they did so at a time when there was no competition between the real masters of photography, since each photographer was sure of his ability and the quality of his work.

Our Club has probably been more successful at an international as well as at a national level than any other group or club in this field. Yet, we regard our greatest achievement the fact that countless photographers of repute have risen from our ranks due, to a large extent, to the training and experience which they received at our hands. Many have since become famous (Biancani, J. L. Michel and Boubat, to mention only a few), and others have founded new clubs in other parts of France. Fortunately, the best of them still maintain active relations with us, taking part in our meetings and exhibitions, which we regard as an assurance that the same standard of high quality will also be maintained in future.

In 1961 the French Museum of Photography was established. This was only possible, however, with the aid of the Council of Bièvres. The existence of a photo museum had simply become a necessity in view of the fact that it was in this country that photography proper

was invented in 1816. We have been able to enjoy the full support of the local government authorities. Thus the town of Bièvres has become an important center for photographic life. Exhibitions, trade fairs and other events have been organized and financially supported by the Musée Français de la Photographie. Since it is still closely associated with the Photo Cine Club du Val de Bièvres, one may well expect that it will continue to have a considerable influence on photographic activities in France. Other useful contacts are also maintained, for example, with the Photo Club Germinal in Brussels, a club in Lausanne, Switzerland, and with the Croydon Camera Club in Great Britain."

The Musée Français de la Photographie is now 15 years old. Its development has been thoroughly positive. Is there not the danger, however, of its becoming institutionalized? The untiring willingness, often accompanied by an agreeably naive attitude, might be ousted one day by a certain degree of bureaucracy.

The occupation of the post of curator of the Musée Français de la Photographie by the President of the Photo Cine Club du Val de Bièvres offers a certain guarantee that the danger is banned for the time being. We thus hope for the sake of both organizations that this will never be the case.

Late evening light can prove dangerous if it is not intentionally included in the composition. The photographer in this case, Paul Genest, is of the opinion that the warm tones provided by a low sun are absolutely predestined to give the complexion a soft and silky appearance. It is important to observe, however, that all the colours appearing in the future photograph are mutually balanced, so that the viewer does not obtain the impression of mixed lighting. Hasselblad 500 EL/M, 135 mm Sonnar, 1/125 sec. at f 6.3 on Ektachrome High Speed.

# PHOTOGRAPHIE

**HOW AN AMATEUR CLUB BECAME A WELL-KNOWN MUSEUM OF PHOTOGRAPHY**



# MUSÉE FRANÇAIS DE LA



# PHOTOGRAPHIE

H. Elkan called his picture "Tables". Whether the graphically interesting tables were found in this position or were arranged, is unknown. Be that as it may, the author succeeded in choosing the most favourable height and camera viewpoint.





J. FAGE, Maya, 1954.



# MUSÉE FRANÇAIS DE LA



# PHOTOGRAPHIE

*Top left:*

L. Raveau: "Bain de pieds" (1957). The photographer—at that time still an "amateur"—shot a series in which he attempted to copy the styles of various 18th century French painters. At least, he was successful in the socially critical aspect of this picture.

*Below:*

L. Biancani: "Face à face"—no date. Biancani is regarded as one of the most prominent members of the Photo Cine Club du Val de Bièvres.

*Right:*

Jean-Louis Michel: "Sleeper"

Amongst the active members of the Photo Club, J. L. Michel is probably the most successful. His style is immediately recognizable. He prefers diffused light and is very skilful in combining line and form to create a balanced composition.

*Page 19:*

Jean Fage, one of the founder members of the Photo Cine Club du Val de Bièvres, shot this photo entitled "Maya" as early as 1954. Essential for the appeal of this picture is the naive character of the whole composition. Many photographers are still trying today to imitate the charm of such photography—usually without success.

*Black-and-white page right:*

A further example of the work of L. Biancani. Technical data are unfortunately unknown. The majority of photos on this page were taken on roll film with a 2 1/4 square Rolleiflex, occasionally with a 35 mm camera. Film, aperture and shutter speed were not given. Anyone interested in further details should write directly to the Musée Français de la Photographie, Mairie de Bièvres, France.





L. BIANCANI



# Control of foreground or background sharpness through calculation

by Dr. Helmut Naumann

In many different kinds of photographs the unsharpness of the fore or background plays an important role. It may be part of the pictorial composition; one may wish to leave undesirable details out of focus or even cause them to vanish, such as the bars of a cage or threads on which small objects are suspended. One can spend much time on experimentation, and often in vain, because one can make no precise predictions about the relative image scale between the main subject and the background (or foreground), the distribution of sharpness or the aperture required for a particular focal length and other given factors. One can solve the problem, however, by calculation. The focal length is, indeed, a decisive factor in the calculation and can be used to control the unsharpness. The calculation shows, above all, whether one has not, in fact, reached the limits of that which is possible and must now try to conceive the picture in another way.

Let us assume the main subject has to be rendered sharp. This might be a fairly distant building in front of which the foreground is to appear unsharp; it could also be a small object close up in the studio in which case the conditions for macrophotography apply. The main subject is represented by the mean scale  $\beta'_o$  which is determined by the latter's size, the film format and the composition of the picture. The taking aperture  $1/K$  is selected on the basis of the prevailing depth of the motif or other factors, such as the type of lens. It might well be that a large relative opening is required for reasons of low light or fast shutter speed. Alternatively, a small aperture would mean a large value for  $K$ . Then we have the maximum permissible unsharpness at the borders surrounding the main object's depth of field. This is not included directly in the following calculations but is simply implied in the correctly determined value of  $K$ . For close-up photography, i.e. with scales of more than  $\beta'_o = 0.05$  to  $0.1$  for the main object, we can take, in order to calculate the depth, the formula

$$t = \frac{2 u'_o \cdot K (1 + \beta'_o)}{\beta_o'^2} \quad (1)$$

(Strict theory requires that the scales  $\beta' \dots$  be made negative; for the sake of simplicity we have scheduled them as positive values—without detriment to the correctness of the calculation).

The unsharpness of the background is represented by a completely different scale value  $\beta'_{vh}$  which is larger or smaller than  $\beta'_o$ . This refers to the size of the unsharp image on the focusing screen/film plane; to measure the image size of, say, a rectangle, one should measure from centre to centre of both unsharp strips.

The amount of unsharpness is  $u'_{vh}$  and is naturally much greater than  $u'_o$  and may, in the case of fairly large formats, be several millimetre in size.

If the object which is to be rendered sharp is, for example, a net and should be recognized as such, then the unsharpness of its image may only be as great as the thickness of the threads of which it is made. A newspaper page on which one is only supposed to notice the general layout and not read the individual lines needs a degree of unsharpness which spreads over 2 to 3 lines. Stems of flowers which must not conceal any part of the main subject require an unsharpness which is likewise much greater than the

thickness of each stem. There is, of course, the question of brightness of the foreground. A regular pattern, such as a cage mesh, is best suppressed in a photograph when one can arrange an even, overall distribution of the diffuse image.

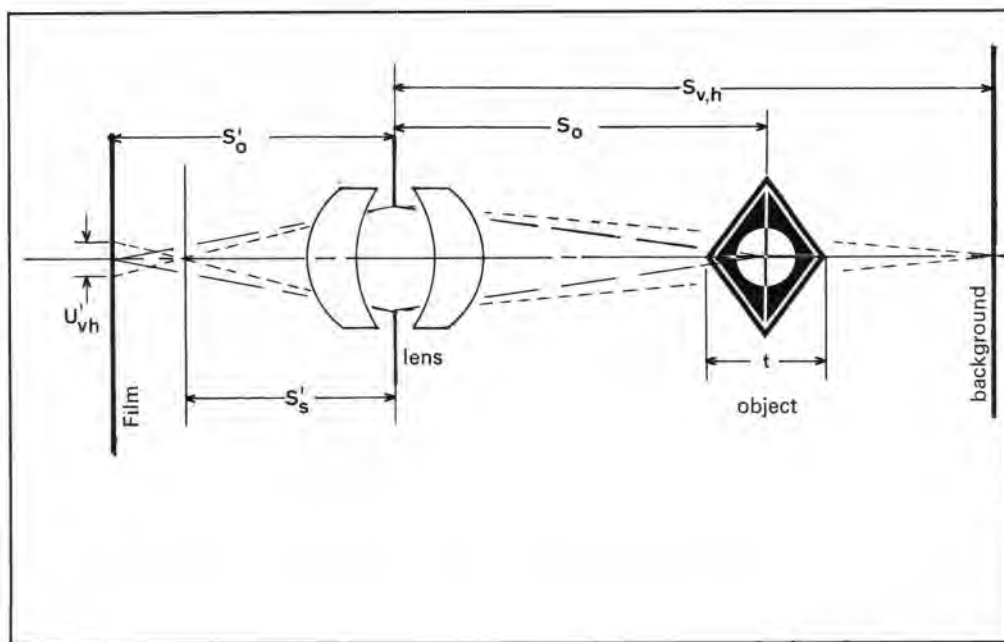
One should remember that for the unsharp rendition of the fore or background one may not apply here the well-known image-forming equation to which we shall come later. It is valid, naturally, for the sharp rendition of the main object in the image plane. If this takes place, as mentioned, at the scale  $\beta'_o$ , then for the image distance—and hence for the bellows extension—we find that

$$s'_o = f' (1 + \beta'_o) \quad (2)$$

for the subject distance

$$s_o = f' (1 + \beta'_o) / \beta'_o. \quad (3)$$

These distances should both be measured from the principal points of the lens which, in the case of a symmetrical system can be taken as being the diaphragm plane. In pronouncedly asymmetrical systems (tele and wide-angle lenses for SLR cameras) these points may be located right outside the lens and this calls for





care when setting up the camera. At any rate, with  $s'_0$  the camera has been set up once and for all; the aperture value  $K$  is dictated—as mentioned—by the main object alone; at the very most one can close down the diaphragm a little more than the main object requires in order to attenuate the unsharpness  $u'_{vh}$ .

If the fore or background are to appear unsharp with a scale of  $\beta'_{vh}$ , then it must be set up at a distance of

$$s_{vh} = f' (1 + \beta'_o) / \beta'_{vh} \quad (4)$$

in front of, respectively, behind the camera. Should this result in unpractical values, either a lens of a different focal length or the image scale must be altered. Important for this calculation is the plane of the sharp image made by the background within the camera; it does not coincide with the emulsion plane but is located nearer towards the lens (for the background) or behind the former (for the foreground). The distance of this plane from the rear principal point can be obtained from the formula

$$s'_s = \frac{f' (1 + \beta'_o)}{1 + \beta'_o - \beta'_{vh}} \quad (5)$$

For the unsharpness, with which the fore or background are reproduced in the emulsion, we have the formula

$$u'_{vh} = \frac{f' (\beta'_{vh} - \beta'_o)}{K (1 + \beta'_o - \beta'_{vh})} \quad (6a)$$

Since these degrees of unsharpness are just as subject to personal judgement as the image scale and the aperture, the focal length of the lens is, in practice, accordingly determined:

$$f' = \frac{u'_{vh} \cdot K (1 + \beta'_o - \beta'_{vh})}{\beta'_{vh} - \beta'_o} \quad (6b)$$

This is the most important formula, and the distances  $s'_o$ ,  $s_0$  and  $s_{vh}$  result therefrom as a matter of course. Whether a detail within the unsharply rendered part of the subject is more or less recognizable or completely invisible depends on the ratio  $z'$  of the image width  $b'$  of a thread, stem, etc. and the actual width  $b$  to the unsharpness  $u'_{vh}$ . One finds for this image width  $b'$

$$b' = b_x \frac{\beta'_{vh}}{(1 + \beta'_o - \beta'_{vh})} \quad (7)$$

and for the ratio

$$z' = b' / u'_{vh} = \frac{b \cdot K \cdot \beta'_{vh}}{f' (\beta'_{vh} - \beta'_o)} \quad (8)$$

This is also an essential and, fortunately, one which can be manipulated on a slide rule. It is clear, that  $z'$  must be as small as feasible and that the light from the image of a thread has to spread itself over as large an area of unsharpness as possible. To this end  $b'$  must be very thin;  $K$  should be small, thus implying a large aperture. A lens of long focal length  $f'$  is also useful, as well as a considerable distance between the main object and the fore/background, which is synonymous with a great difference in scale.

Also of consequence for the invisibility of unsharp details is their brightness in comparison to the background. This depends on their albedo (degree of reflection) which may range from pure white to black. We can assume that we are dealing with matt surfaces and not with highly reflective thread made of metal or nylon. Together with the reflective properties we must also consider the level of illumination. If  $b_{vh}$  is the amount of light,  $a_{vh}$  the albedo of an unsharp detail and  $b_x$ , respectively,  $a_x$  the same values for the latter's background—that may be the sky, studio wall or main object—then it is a matter of the difference

$$D = a_{vh} \cdot b_{vh} - a_x \cdot b_x \quad (9)$$

It should be of a size that the product of  $z' \cdot D$  is less than 2% (or 1% if processing will be contrasty). This means that a detail which still appears too dark against its background should either be illuminated more strongly or coated with chalk to make it disappear; here either  $a_{vh}$  or  $b_{vh}$  is enlarged.

So much for the formulas. In fact, the multitude of possibilities and permutations in combining the factors is so vast that tables or graphs are of little use. One really has to fall back on a slide rule or mini-computer.

Here are a few examples:

1. An arrangement of bottles and glasses is to be photographed on  $9 \times 12$  cm/  $4 \times 5$  in. film against a poster which is to appear unsharp. The scale for the main object is  $\beta'_o = 0.2$  for the poster  $\beta'_{vh} = 0.1$  so that it fills the format. The depth of the main subject requires that the aperture  $K = 22$ . The poster shows structural details which are 3 cm apart and these are to be just visible. Since they will be reproduced 3 mm high, the unsharpness  $u'_{vh}$  must be 1.5 mm. This value should be transferred to the formula 6b, and one finds that  $f' = 36$  cm. A 360-mm Apo-Ronar would do the job. Further, the

bellows have to be extended to 43.2 cm, since the main object/lens distance is  $s_0 = 2.16$  m, whereas the background distance  $s_{vh} = 4.32$  m.

2. The object to be photographed is fastened to a rod (invisible to the camera) which is suspended by loops of thread; the latter may, of course, not appear in the picture. Scale of reproduction for the hovering piece of soap, say,  $\beta'_o = 0.3$ ;  $K = 11$ , enough in order to render the flat front sharp; given is also  $f' = 150$  mm (for angle-of-view reasons) and thus  $s'_o = 195$  mm,  $s_0 = 650$  mm. The threads are arranged only 500 mm behind the main object so that we find  $s_{vh} = 1150$  mm and, through circumscribing the formula 4,  $u'_{vh} = 0.156$  mm. The 1-mm thick threads are reproduced as  $b' = 0.015$  mm, resulting in  $z' = b' / u'_{vh} = \text{approx. } 0.1$ . The light reflected into the lens by the threads will then be spread out to ten times its former area—this is very necessary here. So that their contrast does not exceed that of the background by more than 1–2%, one must darken (or lighten) the threads with chalk or, depending on their length, illuminate them accordingly.

3. Live animals are to be photographed through a wire mesh—the usual zoo problem. Seeing that the animals in this case are large, the camera (with  $f' = 75$  mm) remains focused at infinity; one takes  $\beta'_o = 0$ . The exposure is made at  $K = 5.6$ . The wire net, at 0.5 m in front of the camera, will be unsharp when  $\beta'_{vh} = 0.067$ . Using formula 6a,  $u'_{vh} = \text{approx. } 0.95$ ; 0.5 mm-thick wires will appear 0.033 mm broad and  $z' = 0.035$ . The mesh will tend to vanish completely if it is rusty and set against a fairly dark background. Sunlight on new wire is hopeless.

4. It is perfectly possible to incorporate an equally unsharp foreground and background in the same picture or, like staggered stage sets, several backgrounds, the degree of unsharpness demonstrating their distance from the camera. To develop example 1 even further: an unsharp vignette is to appear between the camera and the main object at 2.16 m; one assumes for the former that  $u'_v = 0.5$  mm, so that it does not flow together with the even unsharper background. After circumscribing the formula 6a, one obtains from the given values  $\beta'_v = 0.23$  and, hence,  $s_v = 1.88$  m. At this distance, and thus not far away from the main object at  $s_0 = 2.16$  m, the vignette is positioned.



# The use of filters in pictorial photography

by H. Bortsch

In practically every manual of photography and in many instruction leaflets accompanying cameras one will find general remarks about the use of filters, the emphasis usually being laid on their effect in *black-and-white photography*. This is one of the reasons why this magazine has often published articles about the correct use of filters in *colour photography*. Most of these contributions were of a specialized nature and it is not our intention to repeat the subject matter here but to provide a *general survey* of filter technology in the light of recent progress in this field. Since a review of this kind should be in keeping with the practical requirements of our readers, the general considerations have been backed up by remarks about the various types of films. It is true, on the one hand, that the widest range of filters are produced by Kodak but, on the other hand, we are still far removed from standardisation or even a uniform designation, and so reference in such a survey to the products of several manufacturers would only confuse the picture. For this reason the names and type designations refer exclusively to Kodak products.

The sheer quantity of filters required would present insoluble problems if aspects other than the purely optical qualities had to be taken into account. For example, were it not for gelatine filters, one would need glass filters in mounts to match lenses of different diameter; further, attention would have to be given to the deviations in the refractive coefficient when several glass filters are used together. It is therefore easy to understand why gelatine filter foils (gels) have, in spite of their being rather fragile, been accepted by the majority of professional photographers. All that is needed is a filter foil holder which can be mounted by various means in front of lenses of varying diameter and into which a standard size of filter gel may be inserted. Gels interfere with the smooth path of the rays to such an infinitesimal extent that even when several foils are combined (a pack of more than two filters is seldom necessary) there will be hardly any perceptible reduction in image sharpness. A further important advantage afforded by gels—especially in medium and large-

format photography—is their negligible weight and the reliable spectral characteristics of each filter one acquires.

## Types and sizes

The filters are supplied in the form of coated gelatine foil in sizes 3 × 3 in./7.5 × 7.5 cm, 4 × 4 in./10 × 10 cm and 5 × 5 in./12.5 × 12.5 cm. They are classified solely according to their spectral characteristics. The following groups result:

1. Filters with step-by-step transition from higher to lower densities
2. Filters which permit short wave lengths to pass and absorb the longer wave lengths
3. Filters which permit the longer wave lengths to pass and absorb the shorter
4. Filters which transmit or absorb only a very limited wave band
5. Monochromatic filters which, either individually or in combination, can isolate one sector of the spectrum.

In addition, there are also colour compensating, light balancing and neutral density filters.

## Filters for black-and-white photography

We assume that the reader is familiar with the general effects of using conventional filters in black-and-white photography. It should suffice to recall the general rule that light rays of the same colour as the filter in use (and those adjacent on the spectrum) are permitted to pass whereas all other colours, and especially those directly complementary, are absorbed. This implies that the colours which are freely passed appear lighter and those which are restricted appear darker in the print. This conversion of colours into grey tones in monochrome film is not only a result of the physical laws of light but is also subject to the peculiarities of the sensitization of a specific film. The majority of modern panchromatic films generally produce a scale of grey tones—without any filter—which correspond more or less to the impression of the eye. Filtration is therefore only carried out in order to correct abnormal illumination conditions or to accentuate the fine difference between

two shades of grey in a subject. The best-known example of this technique is the use of a yellow filter to darken the sky, thus bringing out clouds more clearly.

According to their application black-and-white filters may be divided into the following groups:

|                    |                      |
|--------------------|----------------------|
| correction filters | polarisation filters |
| contrast filters   | infra-red filters    |
| haze filters       | ultra-violet filters |

Correction filters include the yellow filter already mentioned for retaining detail in clouds; a further example is a light blue filter for use in portrait photography in order to reduce the sensitivity of high-speed film to the red end of the spectrum, which otherwise results in pale lips and chalky complexion. A similar correction is required for illumination which has too low a colour temperature. The most frequently used filters in black-and-white photography are the yellow filters Nos. 8 and 9 to compensate for the over-emphasis of blue, the yellow-green filter No. 11 and the blue filter 80B to balance an over-emphasis of red. Contrast filters have the task of separating, more clearly, two colours which would otherwise produce grey tones of similar density in the photographic image. It is of less consequence here if the visual impression given by the final print deviates greatly from the original: the sole purpose is to separate the grey tones more clearly. Theoretically, all colours can be treated in this way. It is of particular significance, however, in photomicrography where one uses the complementary colour to pick out the structure of a coloured part: for example, green is emphasized with the aid of a magenta filter (No. 30), blue with orange (No. 16 or 22) and red with cyan (filters No. 58 and 59).

The haze filters 2B and E are only of academic importance in black-and-white photography. Their effect is so minute that they can be left out of consideration (it is better to retain the effect of "distance perspective" afforded by the haze). If, on the other hand, one definitely wishes to counteract the contrast-reducing effect of haze, the dark yellow filters Nos. 8, 9, 12 or 15 or the orange filters Nos. 16 or 22 are recommended. The use of UV



filters, which belong in the same category, are only of measurable value in photography at high altitudes and can be forgotten in the case of modern multi-coated lenses. For this purpose the filters 1A, 2B and 2E are recommended.

Polarisation filters do not alter the actual spectral composition of light passed, yet reduce its intensity and have an effect on the plane of vibration of light rays.

Infra-red filters usually permit part of the visible long-wave sector of the spectrum to pass through and a fairly large band of invisible infra-red light. According to the requirements, infra-red filters are selected which, on looking through them, appear to transmit either no visible light or only an increasing proportion of dark red. Filters which also transmit a certain proportion of visible light usually permit shorter exposure times. In this category one might include the dark red filters Nos. 25, 29 and 70, whereas the "pure" infra-red filters (Nos. 87 and 88A) involve considerable exposure increase factors (see IPT 4/75 "Infra-red photography").

### Multiplying factors for filters in black-and-white photography

It is absolutely impossible to give reliable exposure increase factors for individual filters without knowing the colour temperature of the illumination and the type of film in use. To be precise, this factor is also related to the density of the negative and the shades of colour found in the subject. As already mentioned, light rays of the same colour as the filter pass through almost unhindered, whereas filters complementary to rays of a particular colour cause a maximum reduction in intensity of the latter. The situation is similar with regard to the sensitization of the emulsion: those films which are principally sensitive to blue will require the smallest corrective factor (and vice-versa) when a blue filter is used. This one example will suffice to show just how approximate such filter exposure factors must always remain. It is a fallacy to believe that one can determine, in the case of doubt, the correct factor by holding the filter in front of the photo cell of an exposure meter and observing the difference in needle deflection. Measurements of this nature must assume comparable sensitivity characteristics in the spectrum range in question. The method is only moderately reliable in the case of well-balanced panchromatic emulsions and fairly low filter density.

## The use of filters in pictorial photography

### Filters for colour photography Colour temperature

The spectral composition of a light source is defined through its colour temperature. This temperature is measured in degrees Kelvin and refers to the temperature to which a black body must be brought so that it emits light of the same colour as the light source in question. This system of measurement is based on Kelvin's absolute scale of temperature.

Colour temperatures of the most important light sources

- clear blue sky 12 000—18 000 °K
- daylight (average) 5 500
- 500-Watt nitraphot lamp  
light output approx. 34 lumen/Watt 3 400
- 500-Watt nitraphot lamp  
light output approx. 27 lumen/Watt 3 200
- 200-Watt lamp  
light output approx. 20 lumen/Watt 2 980
- 100-Watt lamp  
light output approx. 17.5 lumen/Watt 2 900
- 75-Watt lamp  
light output approx. 15 lumen/Watt 2 820
- 40-Watt lamp—light output approx.  
12 lumen/Watt 2 650.

### Kodak light balancing filters

| Colour of the filter | Kodak Filter No. | expos. increase in f-stops | converted from | to      | Mired interval |
|----------------------|------------------|----------------------------|----------------|---------|----------------|
| bluish               | 82 C+82 C        | 1½                         | 2490 °K        | 3200 °K | —89            |
|                      | 82 C+82 B        | 1½                         | 2570 °K        |         | —77            |
|                      | 82 C+82 A        | 1                          | 2650 °K        |         | —62            |
|                      | 82 C+82          | 1                          | 2720 °K        |         | —55            |
|                      | 82 C             | ¾                          | 2800 °K        |         | —45            |
|                      | 82 B             | ¾                          | 2900 °K        |         | —32            |
|                      | 82 A             | ¾                          | 3000 °K        |         | —18            |
|                      | 82               | ¾                          | 3100 °K        |         | —10            |
| yellowish            | 81               | ¾                          | 3300 °K        | 3200 °K | + 9            |
|                      | 81 A             | ¾                          | 3400 °K        |         | + 18           |
|                      | 81 B             | ¾                          | 3500 °K        |         | + 27           |
|                      | 81 C             | ¾                          | 3600 °K        |         | + 35           |
|                      | 81 D             | ¾                          | 3700 °K        |         | + 42           |
|                      | 81 EF            | ¾                          | 3850 °K        |         | + 52           |
| blue                 | 80 A             | 2                          | 3200 °K        | 5500 °K | —131           |
|                      | 80 B             | 1¾                         | 3400 °K        |         | —112           |
|                      | 80 C             | 1                          | 3800 °K        |         | — 81           |
| orange               | 85 C             | ¾                          | 5500 °K        | 3800 °K | + 81           |
|                      | 85               | ¾                          |                | 3400 °K | + 112          |
|                      | 85 B             | ¾                          |                | 3200 °K | + 131          |

All colour films are balanced for a particular colour temperature, the two most important types being emulsions for daylight and artificial light. In practical photography, for the sake of simplicity, colour temperature is not expressed in degrees Kelvin but in so-called Mired values (microreciprocal degrees Kelvin):

$$\text{Mired value} = \frac{1\,000\,000}{^{\circ}\text{K}}$$

Filters for altering the colour temperature are called, in Kodak nomenclature, light balancing filters. The so-called "Mired interval" for a particular colour filter can be taken from the formula

$$\left( \frac{1}{T_1} - \frac{1}{T_2} \right) \times 10^6$$

whereby  $T_1$  represents the colour temperature of a light source without filter and  $T_2$  the colour temperature of the same source with filter in degrees Kelvin. From this it results that warm colour filters which reduce the colour temperature and thus raise the Mired value have a positive Mired interval, whereas cool colour filters (blue) which raise the colour temperature and reduce the Mired value have a negative Mired interval. The following table gives a survey of all Kodak light balancing filters with their corresponding exposure increase factors (which have to be taken more seriously than in black-and-white photography), the colour temperature shift and the corresponding Mired interval.



With the aid of these filters it is possible to compensate for considerable differences in colour temperature, although one must remember that large increases in exposure will bring about an additional shift in colour balance due to reciprocity failure.

To correct slight deviation in colour balance it is preferable to use the CC filters (colour compensating filters). These deviations are due, for example, to permissible manufacturing tolerances in the film emulsion, to the use of a light source which is a little "off" the standard recommended or colour cast caused by very long or ultra-short exposures as already mentioned. Since this type of filter is available in the progressive range of densities and in all colours, it is seldom necessary to use more than one filter. The density and colour of these filters are indicated by a letter and an appropriate figure following it:

Y = yellow      B = blue  
M = magenta    G = green  
C = cyan        R = red

The column "peak density of filter" refers to the density which was measured at the wave length of maximum absorption.

When film, especially colour reversal film, is exposed at a shutter speed which is not within the tolerances stated by the manufacturer, a shift in colour balance will result which has to be compensated for by the use of a CC-filter. The following table gives approximate corrective values for long exposures as obtained from experience. The ultra-short exposure effect has not been taken into account, since it can only be reproduced under absolutely uniform physical-technical conditions. As a general rule the most favourable exposure time for daylight film lies around  $1/50$  sec., whereas that for artificial light film is about 1 sec. This is the reason why artificial light emulsions are generally better for long time exposures—irrespective of the colour temperature of the light source.

In a number of cases, especially in colour photography, it will prove necessary to use neutral density filters. They permit one to reduce the intensity in precise stages and thus retain desired aperture/shutter speed combinations. This is of special importance in copywork carried out at a given level of illumination, and it is also of significance in photomicrography and photomacrography. The Kodak ND filters (No. 96) are absolutely useable throughout the entire spectrum—but not in the infra-red or ultra-violet

## Kodak Color compensating filters

| Peak Density | Yellow (Absorbs Blue) | Exposure Increase in Stops | Magenta (Absorbs Green) | Exposure Increase in Stops | Cyan (Absorbs Red) | Exposure Increase in Stops |
|--------------|-----------------------|----------------------------|-------------------------|----------------------------|--------------------|----------------------------|
| .025         | CC025Y                | —                          | CC025M                  | —                          | CC025C             | —                          |
| .05          | CC05Y                 | —                          | CC05M                   | $\frac{1}{8}$              | CC05C              | $\frac{1}{8}$              |
| .10          | CC10Y                 | $\frac{1}{8}$              | CC10M                   | $\frac{1}{8}$              | CC10C              | $\frac{1}{8}$              |
| .20          | CC20Y                 | $\frac{1}{4}$              | CC20M                   | $\frac{1}{4}$              | CC20C              | $\frac{1}{4}$              |
| .30          | CC30Y                 | $\frac{1}{2}$              | CC30M                   | $\frac{1}{2}$              | CC30C              | $\frac{1}{2}$              |
| .40          | CC40Y                 | $\frac{3}{4}$              | CC40M                   | $\frac{3}{4}$              | CC40C              | $\frac{3}{4}$              |
| .50          | CC50Y                 | 1                          | CC50M                   | 1                          | CC50C              | 1                          |

| Peak Density | Red (Absorbs Blue and Green) | Exposure Increase in Stops | Green (Absorbs Blue and Red) | Exposure Increase in Stops | Blue (Absorbs Red and Green) | Exposure Increase in Stops |
|--------------|------------------------------|----------------------------|------------------------------|----------------------------|------------------------------|----------------------------|
| .025         | CC025R                       | —                          | —                            | —                          | —                            | —                          |
| .05          | CC05R                        | $\frac{1}{8}$              | CC05G                        | $\frac{1}{8}$              | CC05B                        | $\frac{1}{8}$              |
| .10          | CC10R                        | $\frac{1}{4}$              | CC10G                        | $\frac{1}{4}$              | CC10B                        | $\frac{1}{4}$              |
| .20          | CC20R                        | $\frac{1}{2}$              | CC20G                        | $\frac{1}{2}$              | CC20B                        | $\frac{1}{2}$              |
| .30          | CC30R                        | $\frac{3}{4}$              | CC30G                        | $\frac{3}{4}$              | CC30B                        | $\frac{3}{4}$              |
| .40          | CC40R                        | 1                          | CC40G                        | 1                          | CC40B                        | 1                          |
| .50          | CC50R                        | 1                          | CC50G                        | 1                          | CC50B                        | 1                          |

## Filtration for long exposures

| KODAK films                                     |                 | exposure compensation in f-stops<br>colour compensation using CC filters |               |               |                               |                 |
|-------------------------------------------------|-----------------|--------------------------------------------------------------------------|---------------|---------------|-------------------------------|-----------------|
|                                                 |                 | $1/100$ sec.                                                             | $1/10$ sec.   | 1 sec.        | 10 sec.                       | 100 sec.        |
| EKTACHROME sheet film for daylight              | expos. increase | —                                                                        | $\frac{1}{8}$ | 1             | 2                             | not recommended |
|                                                 | CC-Filter       | —                                                                        | 10 B          | 10 B          | 10 B + 10 M                   | —               |
| EKTACHROME sheet film for artificial light      | expos. increase | —                                                                        | —             | —             | See data sheet in each packet |                 |
|                                                 | CC-Filter       | —                                                                        | —             | —             |                               |                 |
| EKTACHROME-X film for daylight                  | expos. increase | —                                                                        | $\frac{1}{8}$ | 1             | 2                             | 3               |
|                                                 | CC-Filter       | —                                                                        | 10 C          | 20 C          | 30 C + 05 G                   | 30 C + 10 G     |
| HIGH SPEED EKTACHROME film for daylight         | expos. increase | —                                                                        | $\frac{1}{8}$ | $\frac{1}{4}$ | 1 $\frac{1}{2}$               | 2 $\frac{1}{2}$ |
|                                                 | CC-Filter       | —                                                                        | 05 R          | 10 M          | 10 M                          | 10 M            |
| HIGH SPEED EKTACHROME film for artificial light | expos. increase | —                                                                        | —             | $\frac{1}{4}$ | 1 $\frac{1}{2}$               | 2 $\frac{1}{2}$ |
|                                                 | CC-Filter       | —                                                                        | —             | 10 R          | 10 R                          | 10 R            |

regions. They are just as suitable for use in front of the camera lens as the Kodak colour compensating and light balancing filters.

The application of polarisation filters and infra-red filters in special fields have

already been discussed in detail in this magazine. There are, of course, a number of other special cases but these lie mostly within the domain of scientific photography and can therefore hardly be included in a survey of this nature.





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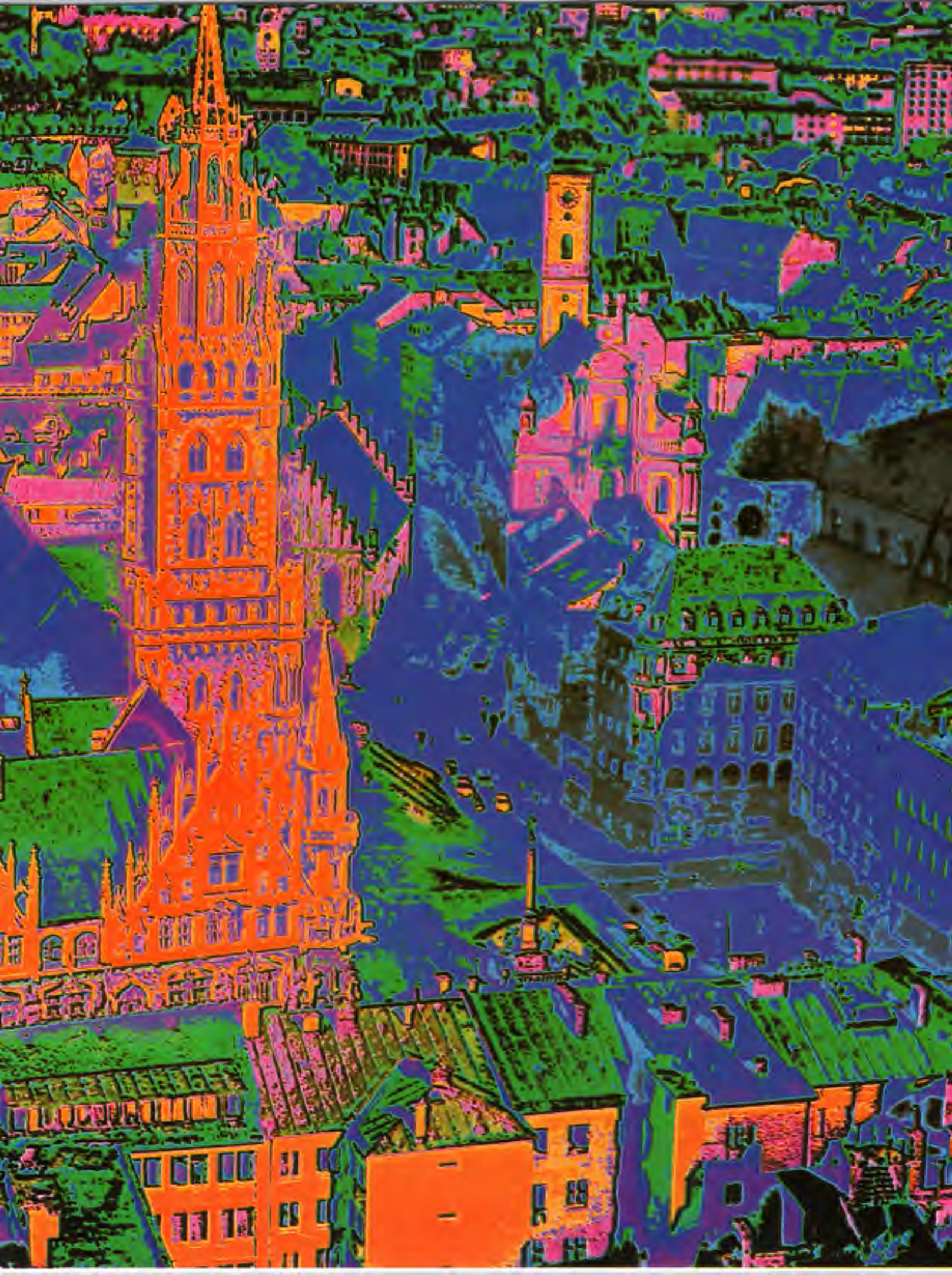
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### **"Chromogenic development" continued**

As a supplementary contribution to the article "Chromogenic development" by Arthur Gewehr (IPT 2/75, page 20) we have decided to publish a few technical comments on the subject sent in by Niklas Deak.

The American photographer has been working for quite some time with Agfacontour film and has gathered sufficient experience in the meantime to say that he knows what he is talking about. Due to a residual factor of unpredictability in the process, he has found it is better to always work according to one constant method.

He describes it as follows: equi-densities are those parts of the original which exhibit the same degree of blackening (density) (or, to quote D. A. Spencer in "Focal Dictionary of Photographic Technologies", 'Film which yields a negative isodensity outline image on exposure through a continuous tone negative or positive on normal processing'). Separations of such equi-densities can be obtained via Agfachrome film by exposing for different times and processing in the special developer which is available from Agfa in fairly large packs. For example, one can double or treble the exposure time, receiving in each case a new negative, respectively, positive, with other lines of equal density. The short exposure times isolate the lighter portions and the longer times the darker areas of the motif. If this technique is pursued with great care, it is possible to obtain, under certain circumstances, up to eight equi-density separation negatives.

One can also arrive at similar results (or merely enhance the effect) by producing some of the equi-density separations on Gevalith-Ortho O81—once again doubling the exposure time—and, to be precise, by a partial solarisation (Sabattier effect): e. g., after developing the film for 30 sec. it should be exposed to white light and then development continued.

The individual equi-density separations are then copied—up to four times on to Gevalith-Ortho O81. The separations appear black against a transparent background. The next step is bleaching, for which the bleaching bath N II from the Agfacolor Negative Kit should be used, until the image is reduced to a milky white. After thorough washing, chromogenic development proper takes place. For this purpose one uses the Agfacolor colour coupler set which consists of the three primary colours yellow, red and blue. These may be mixed in the desired quantities so that one obtains 28 hues. After development, bleaching and fixation, the chromogenic development is completed. One then has a selection of variously coloured films for each equi-density separation.

Re-copying takes place most expediently on to colour negative film or paper. The author personally recommends Agfacolor Positive M film which should be processed in the Agfacolor Pa Kit or Ektacolor Print which should be processed according to the manufacturer's instructions.

Should certain portions of the montage appear too dark or too light on the Positive M film, they can be superimposed with additional colour by means of solarisation, i. e. after four minutes of development one can "burn in" additional coloured light and then continue with the development.

Here is a further example of how one can successfully apply the technique of chromogenic development plus Agfacontour film in creative photography.  
Photo: Niklas Deak, USA.

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## **Professional enlargers up to 9x12 cm/4x5 in.**

The questionnaire entitled "the ideal enlarger—does it exist?", in which we invited our readers to participate, revealed a number of interesting facts which we published in IPT 3/75. In contrast to our expectations, the average reader did not desire a top-class instrument bristling with gadgets; the enquiry showed, rather, that a rigid, versatile apparatus of uncomplicated design is what is sought after and usually found. The really expensive enlargers are only likely to find a place in specialized laboratories. It was surprising to discover that features such as automatic focusing, distortion correction and other specialized facilities were not all that highly estimated. One appears to be merely grateful when the purchased enlarger offers more than one actually requires.

Yet, we feel it will be of interest to our readers to include all those apparatuses, sophisticated or not, which were mentioned in the enquiry returns. It would be ridiculous, however, to try and introduce *all* those enlargers which are at present available on the international market. Firstly, we have not got the space and, secondly, it would cost too much of your and our time to piece together an absolutely comprehensive survey. Further, in whose interests would that be? It would only add to the confusion which exists on this market already; we feel that almost *too large* a variety of enlargers are on offer to the prospective customer. Some firms list twenty different types in their catalogue many of which are merely variants with a different knob here or an extra screw there. This is not to be

taken as criticism of any individual manufacturer; one might consider such a differentiated palette as an advantage in that a photographer can select just the very enlarger he requires for his specific purposes.

With such considerations in mind, we have therefore only described the more popular makes of apparatus and even some of these will be quite unknown to a good number of readers. The market survey "Enlargers" is so extensive that we have decided to spread it over two numbers.

In the first part, enlargers up to 9 × 12 cm/4 × 5 in. are catalogued and in the second part even larger apparatus up to a format of 8 × 10 in. will be found. As a basis for the information, we have taken the data quoted us by the manufacturers. We have avoided exercising any criticism, since such value judgements remain, to a large extent, subjective and do not really help the reader in his choice, especially the critical reader. Such reports belong to the field of sales manipulation, and this is something which we prefer not to indulge in. We should like to ask both manufacturers and readers for their understanding should they find that a particular enlarger has been omitted. It is not our intention to give preferential treatment to any manufacturer or individual apparatus. There is also no point in publishing an endless row of tables just to prove that the editors are familiar with every enlarger on the international market. We *do* know about them all, only we believe that it is in the interests of our readers to trim down the selection somewhat.





## Agfa Varioscope 60

*Formats:* 8 × 11 mm up to 6 × 9 cm/2¼ × 3¼ in.

*Column:* Tubular parallelogram system

*Compensation for head weight:* Spring-counterweighted parallelogram

*Baseboard:* 50 × 60 cm/19.7 × 23.6 in.

*Adjustment of head:* Manual; secured by means of friction brake

*Negative holder:* Universal negative carrier with individually adjustable masking bands, provision for Newton's rings

*Focusing:* Automatic, coupled for two focal lengths

*Light system:* Direct, with double condenser

*Available lenses:* F 4.5 Magnolar of 60 and 105 mm focal length

*Magnification factor:* Automatic 12.5 × (60 mm), 6 × (105 mm); Manual 14.7 × (60 mm), 7.2 × (105 mm)

*Possible to reduce:* With extension tube 2.5 × (105 mm)

*Correction of distortion:* None

*Special features:* Agfa colour head with conventional correction filters, condenser illumination

*Manufacturer:* Agfa-Gevaert AG., D-5090 Leverkusen/Bayerwerk



## Ahel 1200

*Formats:* 8 mm to 4 × 5 in.

*Column:* Square column incorporating geared rack

*Compensation for head weight:* Spring-counterweighted parallelogram

*Baseboard:* 50 × 60 cm/19.6 × 23.6 in.

*Adjustment of head:* Manual by means of crank and geared rack, additional parallelogram system with spring compensation

*Negative holder:* Book-type carrier with/without glass, adjustable mask bands for all formats

*Focusing:* Manual, friction drive via knob

*Light system:* Direct, with condensers (6 different units) diffusing screen, cold light and point-source lamp units; push-in condenserless colour head

*Available lenses:* 150 mm Schneider; other lenses via adapters

*Magnification factor:* Depends on format and focal length, unlimited when swung horizontal

*Possible to reduce:* Ditto; extension tube available

*Correction of distortion:* Through tilting the enlarger head and lens standard

*Special features:* May be adapted for copying and colour enlarging

*Manufacturer:* 5 et 7, Rue Plumet, F-75 Paris 15e/France



## Beseler 45 MCX

*Formats:* From 8 mm up to 4 × 5 in.

*Column:* Triangular truss construction

*Compensation for head weight:* Not necessary; motor drive

*Baseboard:* 51.8 × 64.8 cm/20 × 25.5 in.

*Adjustment of head:* Via electric motor

*Negative holder:* Glassless, revolving negative carriers from 8 mm to 4 × 5 in., "Negaflat" for 4 × 5 and "Negatrans" for 35 mm & roll film with remote control film advance

*Focusing:* Via electric motor

*Light system:* Lamp housing with adjustable condensers for all formats and drawer for filters 6.3 × 6.3 in., point-source lamp

*Available lenses:* From Rodenstock and Schneider as desired

*Magnification factor:* 3.5× for 4 × 5 in.; 7× for 6 × 9 cm; 32× for 16 mm

*Possible to reduce:* 4× or even more; depends on lens and format

*Correction of distortion:* Lens mount may be tilted 20° in both directions

*Special features:* Colour head Dichro DG, copying assembly with or without reflex attachment, international camera back

*Manufacturer:* Beseler Photo Marketing Inc., 219 S. 18th. St., East Orange, N. J. 07018



## Beseler CB 7

*Formats:* From 8 mm up to 4 × 5 in.

*Column:* Triangular truss construction

*Compensation for head weight:* Not necessary; motor drive

*Baseboard:* 40 × 50 cm/15.75 × 19.7 in.

*Adjustment of head:* Electric motor, controlled from switch panel at front of baseboard

*Negative holder:* Glassless, revolving negative carriers from 8 mm to 4 × 5 in., "Negaflat" for 4 × 5 and "Negatrans" for 35 mm & roll film with remote-control film advance

*Focusing:* Via electric motor, controlled from switch panel at front of baseboard

*Light system:* Lamp housing with adjustable condensers for all formats and drawer for filters 6.3 × 6.3 in., point-source lamp

*Available lenses:* From Rodenstock and Schneider as desired

*Magnification factor:* 3.1× from 4 × 5 in., 16× from 35 mm, tilts back 90° for wall projection

*Possible to reduce:* 4× or even more; depends on format and lens

*Correction of distortion:* Negative stage and lens mount swivel

*Special features:* Colour head Dichro DG, copying assembly with or without adjustable reflex attachment, international camera back

*Manufacturer:* Beseler Photo Marketing Inc., 219 S. 18th. St., East Orange, N. J. 07018





## Chromega B Dichroic

*Formats:* From subminiature to 6 × 6 cm/2¼ × 2¼ in.

*Column:* Cantilevered girder, revolves through 180°

*Compensation for head weight:* Compensating springs

*Baseboard:* Not given

*Adjustment of head:* Manual, rapid adjustment with spring compensation

*Negative holder:* Hinged glassless negative carrier, format masks

*Focusing:* Manual, fine adjustment

*Light system:* Indirect-light colour head also suitable for b/w, 24 V/75 W cold-mirror halogen lamp, dichroic filters

*Available lenses:* From Schneider and Rodenstock

*Magnification factor:* 7.6× with 3-in. lens, 12.5 with 2-in. lens, floor projection possible

*Possible to reduce:* Not given

*Correction of distortion:* Not provided

*Special features:* None

*Manufacturer:* Berkey Marketing Companies Inc., Omega Division, Woodside, New York 11377



## Super Chromega II D 5 XL Dichroic

*Formats:* Up to 4 × 5 in.

*Column:* Cantilevered girder, revolves through 180°, length 137 cm/54 in., also 106 cm/41.4 in.

*Compensation for head weight:* Compensating springs

*Baseboard:* 56 × 86 cm/22 × 33.8 in.

*Adjustment of head:* Manual, rack and pinion

*Negative holder:* Carriers with or without glass, special rapid-shift carrier for 35 mm and roll film, carrier rotates

*Focusing:* Normal lens standard focusing backed up by fine "Micro-megra" focusing

*Light system:* B/w lamp head with variable triple condensers, colour head Super Chromega Dichroic II, light integrating and colour mixing chambers for 6 × 7 cm to 4 × 5 in.

*Available lenses:* From Schneider or Rodenstock

*Magnification factor:* 6.5× from 4 × 5 in., 35× from 35 mm; onto the floor about 15× from 4 × 5 in.

*Possible to reduce:* Depends on format & focal length

*Correction of distortion:* Not provided

*Special features:* Omega worktable, double bellows extension

*Manufacturer:* Berkey Marketing Companies Inc., Omega Division, Woodside, New York 11377



## De Vere 504 Dichromat 3

*Formats:* Up to 4 × 5 in.

*Column:* Special section column

*Compensation for head weight:* Not stated

*Baseboard:* 64 × 72 cm/25.2 × 28.3 in.

*Adjustment of head:* Manual, through turning knobs at the front of the baseboard

*Negative holder:* Hinged-type carrier with adjustable format bands and register system

*Focusing:* Manual, by means of turning knob at the front of the baseboard

*Light system:* Reflex system colour head, with or without condensers

*Available lenses:* Choice of lenses up to 150 mm

*Magnification factor:* Depends on format and focal length

*Possible to reduce:* Ditto

*Correction of distortion:* Through tilting the lens standard

*Special features:* 45 cm/17.7 in. bellows extension; can be adapted for copying

*Manufacturer:* De Vere Ltd., Thayers Farm Road, Kent BR3 4 NB England



## Durst A 600

*Formats:* All formats up to 6 × 9 cm

*Column:* Special triangular section with inner stiffening, 130 cm long

*Compensation for head weight:* Spring element

*Baseboard:* 49.5 × 60 cm/19.5 × 23.6 in.

*Adjustment of head:* Friction by knob, override for rapid height adjustment, provision for making series

*Negative holder:* Glass sandwich with adjustable format masks

*Focusing:* Automatic focusing for three (coupled) focal lengths—50, 80, 105 mm—

*Light system:* Reflex illumination system, cold light, point-source lamp, colour head CLS 201 (condensers), or CLS 450 (no condensers)

*Available lenses:* 50, 80, 105 mm lenses from Schneider, Rodenstock

*Magnification factor:* 7× using 105 mm; 10.3× using 80 mm; 17× using 50 mm lens; up to 33.5× proj. onto floor

*Possible to reduce:* Not given

*Correction of distortion:* Not provided

*Special features:* Copying illumination unit, copying cassette with register system, copying magazine for 35 mm × 30 mm film

*Manufacturer:* Durst AG, I-39100 Bozen, Postfach 445  
Durst (UK) Ltd., Longmead Industrial Estate, Epsom, Surrey, England





## Durst DA 900

*Formats:* All formats up to 6 × 9 cm

*Column:* Special triangular section with inner stiffening

*Compensation for head weight:* Spring element

*Baseboard:* 49.5 × 60 cm/19.5 × 23.6 in.

*Adjustment of head:* Friction drive by knob, override for rapid height adjustment

*Negative holder:* Carriers with or without glass, fixed format masks

*Focusing:* Auto-focus of two lenses mounted on slide

*Light system:* Cold light, reflex illumination system with or without condensers, point-source lamp, colour head CLS 201 (condensers), CLS 450 (none)

*Available lenses:* Combination of 50/105 mm, 50/80 mm, 50/28 mm

*Magnification factor:* 31.5× with 28 mm down to 7× with 105 mm lens, between 61.5× and 14.8× onto floor

*Possible to reduce:* No

*Correction of distortion:* Not provided

*Special features:* Copying illumination unit, copying cassette with register system, magazine for 35 mm × 30 m film

*Manufacturer:* Durst AG, I-39100 Bozen, Postfach 445  
Durst (UK) Ltd., Longmead Industrial Estate, Epsom, Surrey, England



## Durst M 800

*Formats:* 35 mm up to 6 × 9 cm/2¼ × 3¼ in.

*Column:* Square section column with interior profile

*Compensation for head weight:* Not provided

*Baseboard:* 50 × 55 cm/19.69 × 21.65 in.

*Adjustment of head:* Friction drive with folding crank handle

*Negative holder:* Glass sandwich with adjustable masking bands carriers also without glass

*Focusing:* Manual, via friction drive

*Light system:* Reflex illumination system with or without condensers, colour heads CLS 201 or CLS 80

*Available lenses:* From Schneider, Rodenstock or EL-Nikkor

*Magnification factor:* 7.5× from 6 × 9 cm, 17× from 35 mm, unlimited when swung horizontal

*Possible to reduce:* Macro/micro field with bellows + Dutub II

*Correction of distortion:* Through tilting the head and the lens mount

*Special features:* Copying illumination unit, copying cassette, point-source lamp, etc.

*Manufacturer:* Durst AG, I-39100 Bozen, Postfach 445  
Durst (UK) Ltd., Longmead Industrial Estate, Epsom, Surrey, England



## Durst Laborator 1000

*Formats:* 35 mm to 4 × 5 in.

*Column:* Special triangular section with inner stiffening, 139 cm/55 in.

*Compensation for head weight:* Spring compensation with elastic action

*Baseboard:* 50 × 60 cm/19.6 × 23.6 in.

*Adjustment of head:* Manual, friction drive with folding crank handle

*Negative holder:* Glass sandwich with individually adjustable format masks, also carriers without glass

*Focusing:* Manual, friction drive with folding crank handle

*Light system:* Cold light, point-source lamp, reflex illumination system with/without condensers, Colour head CLS 201 (condensers), or CLS 450 (none)

*Available lenses:* From Schneider, Rodenstock, EL-Nikkor, etc.

*Magnification factor:* 5× from 4 × 5 in., 19× from 35 mm, depends on focal length and format

*Possible to reduce:* Macro/micro field with bellows + Dutub II

*Correction of distortion:* Through tilting the head and swinging special lens plate for 75 and 150 mm lenses

*Special features:* Copying illumination unit, copying cassette, with or without register system

*Manufacturer:* Durst AG, I-39100 Bozen, Postfach 445  
Durst (UK) Ltd., Longmead Industrial Estate, Epsom, Surrey, England



## Durst Laborator L 900

*Formats:* All formats up to 6 × 9 cm

*Column:* Square section column, 128 cm/50.3 in. long with raised focus variator, turns through 180°

*Compensation for head weight:* Via Spring elements

*Baseboard:* 65 × 70 cm/25.5 × 27.5 in.

*Adjustment of head:* Manual, rapid and fine adjustment

*Negative holder:* Hinged-type carrier with adjustable format bands, with/without glass, register system

*Focusing:* Automatic focusing for two focal lengths (50 mm and 80 mm)

*Light system:* At present only colour head CLS 450, no condensers, with built-in blower

*Available lenses:* Two lenses mounted in sliding carriage, 50 and 80 mm

*Magnification factor:* 9.7× for 6 × 9 cm format and 80 mm lens 16× for 35 mm film and 50 mm lens

*Possible to reduce:* No

*Correction of distortion:* Not provided

*Special features:* Lamp head for black-and-white only is in preparation

*Manufacturer:* Durst AG, I-39100 Bozen, Postfach 445  
Durst (UK) Ltd., Longmead Industrial Estate, Epsom, Surrey, England





## Durst Laborator L 54

*Formats:* All formats up to 4 × 5 in.

*Column:* Round section with strengthening ribs

*Compensation for head weight:* Spring elements

*Baseboard:* 60 × 80 cm/23.6 × 31.5 in.

*Adjustment of head:* Manual, with automatic factor scale

*Negative holder:* Hinged-type carrier with individually adjustable masks, with/without glass

*Focusing:* Manual, auto-focus for 150 mm lens (the negative carrier is moved, not the lens!)

*Light system:* Cold light, point-source lamp, reflex illumination with or without condensers. Colour head CLS 201 (condensers) or CLS 401 (none)

*Available lenses:* Choice from Schneider, Rodenstock, Nikkor

*Magnification factor:* 5× for 4 × 5 in., 17× for 35 mm; unlimited when swung forwards horizontal

*Possible to reduce:* Macro/micro field using bellows + Dutub II

*Correction of distortion:* Through tilting the negative carrier in 2 directions and through tilting + shifting lens standard

*Special features:* Copying illumination unit, copying cassette, register system, automatic focusing when copying between 5× and 0.9× linear

*Manufacturer:* Durst AG, I-39100 Bozen, Postfach 445  
Durst (UK) Ltd., Longmead Industrial Estate, Epsom, Surrey, England



## Focomat Ilc

*Formats:* 13 × 17 cm up to 6 × 9 cm/2¼ × 3¼ in.

*Column:* 80 cm/31.5 in. long, 60 mm diam. tube

*Compensation for head weight:* Spring-counterweighted parallelogram

*Baseboard:* 53.5 × 74 cm/21 × 29 in.

*Adjustment of head:* Manually by means of parallelogram system, secured by means of friction brake

*Negative holder:* Glass sandwich negative carrier, one-sided glass carrier for 35 mm, special holder for plates, compartment drawer for negative masks

*Focusing:* Auto-focus 11 × magnification with 60 mm lens, 5.7 × magnification with 100 mm; greater magnification by manual focusing

*Light system:* Direct, double condenser with 150 W opal lamp

*Available lenses:* 60 mm f 4.5 Focotar, 100 mm f 4.5 V-Elmar

*Magnification factor:* Up to 16 ×

*Possible to reduce:* Down to 1:2.5

*Correction of distortion:* Negative holder swivelling device, accessory bellows

*Special features:* For colour enlarging with colour heads from Agfa, Durst, Super Chromega; filter drawer for CP filters 12 × 12 cm/4.7 in.; usable format for electron micrography 62 × 65 mm

*Manufacturer:* Ernst Leitz GmbH., D-6330 Wetzlar



## Homrich VA 3 and VA 5

*Formats:* Up to 4 × 5 in.

*Column:* Girder column with inclined base section 130 cm/51 in. long

*Compensation for head weight:* Not provided

*Baseboard:* 69 × 67 cm/27.1 × 26.3 in.

*Adjustment of head:* Manual by means of crank

*Negative holder:* Hinged-type carrier, with/without glass, adjustable mask bands

*Focusing:* Manual by means of handwheel at column base

*Light system:* Direct, with double condensers or point-source lamp; on model VA 5 the lamp house can be adjusted axially via geared rack

*Available lenses:* Choice of lenses up to 150 mm

*Magnification factor:* Depends on focal length and format

*Possible to reduce:* Ditto

*Correction of distortion:* Not provided

*Special features:* Copying light unit, copying adapter with rapid slide, right-angle mirror for giant enlargements

*Manufacturer:* Ferd. Homrich & Sohn, D-2000 Hamburg 50, Große Rainstr. 41—45



## Homrich VA St 9 and VA 9

*Formats:* 35 mm up to 4 × 5 in.

*Column:* Special section column 121 cm/47.5 in. long

*Compensation for head weight:* Not provided

*Baseboard:* 60 × 70 cm/23.6 × 27.5 in.

*Adjustment of head:* Crank and screw system

*Negative holder:* Glassless hinged-type carrier, with or without masking bands

*Focusing:* Manual, via star knob and chain

*Light system:* Colour head, condenserless, fitted with two halogen lamps (VA St 9), also suitable for black and white

*Available lenses:* Wide range of lenses from 50 to 150 mm

*Magnification factor:* Depends on format and focal length

*Possible to reduce:* Ditto

*Correction of distortion:* Not provided

*Special features:* Cooled by means of double blower on the column, copying light unit, copying adapter with rapid slide

*Manufacturer:* Ferd. Homrich & Sohn, D-2000 Hamburg 50, Große Rainstr. 41—45





## Linhof "Compact" B/W enlarger

*Formats:* 35 mm up to 4 × 5 in.

*Column:* Square steel column of 40 mm section, turnable

*Compensation for head weight:* Brake, self-acting only in a downwards direction

*Baseboard:* 66 × 60 cm/26 × 23.6 in.

*Adjustment of head:* Manual, rack and pinion with crank

*Negative holder:* Hinged-type carrier with glass, format masks

*Focusing:* Manual

*Light system:* Direct, with double condensers, opal lamp

*Available lenses:* Choice of Schneider or Rodenstock lenses

*Magnification factor:* 7.2× with 150 mm lens from 4 × 5 in.; depends on format and focal length; unlimited horiz.

*Possible to reduce:* Not given

*Correction of distortion:* Not provided

*Special features:* None

*Manufacturer:* Linhof Präzisions-Kamera-Werke GmbH., D-8000 München 70, Rupert-Mayer-Str.45



## Linhof RC 45 (table or floor-stand model)

*Formats:* 35 mm up to 4 × 5 in.

*Column:* Square section steel column 70/90 mm

*Compensation for head weight:* Counterweights in the column

*Baseboard:* 60 × 90 cm/23.6 × 35.4 in.

*Adjustment of head:* Manually via rack and pinion; accessory motor drive for floor-stand model

*Negative holder:* Glass hinged-type carrier, register system, format masks

*Focusing:* Manual or motor-driven

*Light system:* Reflex system with double condensers, opal lamp or halogen point-source lamp, condenserless colour head

*Available lenses:* Wide selection of process or enlarging lenses

*Magnification factor:* 6.5× (150 mm lens from 4 × 5 in. format), 7.5× with stand model; unlimited horizontally

*Possible to reduce:* 2× with 150 mm lens from 4 × 5 in. format

*Correction of distortion:* Swivelling negative carrier and lens standard

*Special features:* Converts to full-scale process camera through range of accessories

*Manufacturer:* Linhof Präzisions-Kamera-Werke GmbH., D-8000 München 70, Rupert-Mayer-Str.45



## Teufel VG 6x9 Fach

*Formats:* 35 mm up to 6 × 9 cm/2¼ × 3¼ in.

*Column:* Vertical 75-cm/29.5-in. column of 40 mm diam., parallelogram system

*Compensation for head weight:* Via two springs in the parallelogram system

*Baseboard:* 55 × 60 cm/21.6 × 23.6 in.

*Adjustment of head:* Manual, by means of parallelogram system

*Negative holder:* Glass carriers, revolving frame, roll film stage

*Focusing:* Manual, friction adjustment

*Light system:* Direct, double condensers, 150 W opal lamp, up to 250 W using resistance

*Available lenses:* 60 mm, 75 mm or 80 mm Rodenstock on rapid-change mount

*Magnification factor:* 7.5× from 6 × 9 cm + 105 mm lens; 17.4× from 35 mm + 60 mm lens

*Possible to reduce:* 1× with 105 mm lens; 3× with 60 mm lens

*Correction of distortion:* Lens mount and head may be tilted

*Special features:* Convertible to colour by means of filter drawer; accepts colour heads from Agfa and Chromega

*European distributor:* Paul Teufel + Cie., D-7000 Stuttgart-West, Postfach 1102



## Teufel VG 4x5"

*Formats:* 6 × 9 cm/2¼ × 3¼ in. up to 4 × 5 in.

*Column:* Vertical 85-cm/33.4-in. column of 50 mm diam., parallelogram system

*Compensation for head weight:* By means of two springs in the parallelogram system

*Baseboard:* 62.5 × 74 cm/24.5 × 29.1 in., plastic surface

*Adjustment of head:* Manual, by means of parallelogram system

*Negative holder:* Glass carriers, revolving frame, roll film stage

*Focusing:* Manual, friction adjustment

*Light system:* Direct, single and double condensers, 250 W opal lamp

*Available lenses:* Various focal lengths from 50 to 150 mm

*Magnification factor:* Between 5.6× and 14× depending on format and focal length, head swings horizontal

*Possible to reduce:* 4.5× depending on format and focal length

*Correction of distortion:* Provided

*Special features:* Possible to mount Agfa or Super Chromega D II colour heads, filter drawer, "Teufel" additive filter cassette

*European distributor:* Paul Teufel + Cie., D-7000 Stuttgart-West, Postfach 1102



# Underwater photography in the ideal format

Horst Moosleitner



*Black and white photos:*

Even under the surface of the water the basic rules of composition still apply. Although the submarine photographer may be pressed for time and rarely have the opportunity to frame a motif as he would really like, he must at least try to leave sufficient margin around the main subject for subsequent, more effective cropping.

These three photos taken from a 1976 calendar (by H. L. Stutte of Weidach) are proof indeed that a rough calculation before releasing the shutter is well worth while.



The fascinating world to be found below the surface of the sea was, apart from a few exceptions such as Hass and Cousteau, a domain left to amateur photographers up until a few years ago. Now, however, on account of the increasing number of skin divers, the inclusion of underwater photographs in picture-books—of either a zoological, botanical, geographic or sports nature—and the publication of countless magazines on the topic of diving, submarine photography has been raised from its purely amateur status. There are, indeed, now several professionals who earn most of their living through underwater photography.



*Colour page, right:*

Giant mussel, *tridacna gigas* with perch. A carnivorous shell-fish which can reach a length of up to 5 feet/1.5 m. It is also the largest mussel to be found in the Indian Ocean.











# Underwater photography in the ideal format

A number of publishing houses are in need of good underwater photographs. Their printers demand as large an original format as possible and so many a serious UW photographer has switched over from 35 mm to the medium format. Although underwater housings are now available for most of the  $2\frac{1}{4}$  square cameras, the Hans Hass "Rolleimarin" still enjoys great popularity in spite of apparent shortcomings, especially at close quarters. Praktisix, Hasselblad and Rollei SL 66 are better alternatives, although considerably more expensive.

Obviously, there is an upper limit to the feasible size of film formats. Film changing is not possible under water and so large-format sheet film cameras are excluded from the outset; apart from the difficulty of handling such a large camera in a waterproof housing, it is hardly worth while diving for the sake of a single shot. Further, the majority of underwater motifs is usually to be found at close range. This implies a viewfinder system which is free of parallax. Frame finders are therefore only really suitable for an overall shot. For these reasons the single-lens reflex camera has proved the most suitable apparatus for underwater photography.

It was a welcome event when the Munich firm Aschober & Hanrieder decided to adapt their "Deniz" housing for the Mamia RB 67 thus creating the first waterproof housing for an ideal format camera. As our readers will know, the

Some pictures taken under water, that can be used for scientific studies.

All photos: Horst Moosleitner.  
Rollei SL 66 in underwater housing.



56 × 72 mm ideal format provides, as a printing original, almost double the usable area in comparison to a corresponding, proportionally-cropped section from a  $2\frac{1}{4}$  ×  $2\frac{1}{4}$  in. transparency.

The would-be underwater photographer should, before the purchase of an ideal format camera, give consideration to what he intends doing with the finished transparencies. If he intends offering them to publishers and editors, then the ideal format is the most suitable solution. For slide shows, on the other hand, he will discover that projection apparatus larger than 6 × 6 cm is unlikely to be available, and even bringing along a projector of one's own will not solve the problem of different hall sizes.

Of course, to produce 6 × 6 slides from the ideal format, one merely has to crop suitable transparencies an appropriate amount. The apparent "disadvantage" of having too large a film format can, in practice, often be turned into an advantage: it is, namely, not always possible to exactly determine the picture section at the moment of exposure, especially in the case of such fast moving objects as fish. The more generous area of the larger format leaves one sufficient margin around the centre motif to crop it and obtain a good  $2\frac{1}{4}$  square slide or smaller.

Seen in this light, the ideal format would appear to be highly suitable for all aspects of UW photography, thus adding a further field to the already universal scope of this kind of camera.

*Colour page, left:*

Preris volitans, a highly poisonous inhabitant of the Indian Ocean but one of the most beautiful.

Both photos: H. L. Stutte, Weidach.  
Rollei SL 66 in underwater housing, Ektachrome professional 120.





# Are there better heads?



No matter which kind of heads you prefer, you will find the suitable head in the LINHOF manufacturing programme. An offer which is unique in its kind comprising all fields of phototechnical activities: still photo, video and film. For any camera weight the suitable head from LINHOF! All LINHOF heads offer the decisive advantages: Long lasting design, technically perfect concept, handy execution, made of first-class metals without plastic parts, therefore extremely wear-resistant.



Our programme:

- Pan heads
- Video heads
- 3-Way heads
- Cine pan heads
- Precision tilttops
- Hydraulic Cinematic pan heads

LINHOF head features:

Freedom from play also in unclamped position, as well as absolute locking of any camera in any position.

The ideal combination:

One manufacturer for camera + tripod + head: LINHOF!



*Linhof*

PRÄZISIONS-KAMERA-WERKE GMBH  
D-8 MÜNCHEN 70 · POSTFACH 70 1229



## Linhof 220 RS—a rapid-action hand camera for the ideal format

The new Linhof 220 RS (for Reportage and Sport) incorporates all those technical features which are required of a modern snapshot camera:

- compact, light and always ready to shoot
- adjustable anatomic handgrip mounted at the side
- 56 × 72 mm ideal format
- large, bright-line view/range finder
- coupled exposure meter
- provision for 120 or 220 roll film
- roll film inserts for rapid reloading

Almost as compact as a 35-mm camera, and not much heavier, the Linhof 220 RS offers five times the usable negative format and copes

fast in operation. The Linhof 220 RS therefore has a rapid-advance lever which transports the film, cocks the shutter and excludes the danger of double exposures. Time can be saved by using special inserts which have been loaded beforehand with film. It is possible to load both 120 or 220 roll film. This means the photographer has the choice of ten or twenty exposures in the 56 × 72-mm ideal format at his disposal without reloading.

The 220 RS has a combined view/rangefinder which incorporates a bright-line frame and exposure data from the coupled meter; this enables one to view and shoot even under poor light conditions. The camera is fitted with the well-proven 95 mm f 3.5 Linhof Technika lens which guarantees outstanding sharpness and high colour fidelity. Setting the aperture and shutter speed, as well as checking the depth of field, are carried out at a glance from above. The Synchro-Compur shutter has speeds from 1 second to  $\frac{1}{500}$  and B, M and X flash connections and self-timer with 10 second delay. There is also provision for attaching flash units either with synchronizing cable or of the hot-shoe type.

In designing the 220 RS, Linhof's aim was to produce a compact, high-performance camera with a relatively large format and which would enable the photographer to forget technicalities and concentrate on his subject. This handy camera has proved to be equally suitable for camera journalism, sport, fashion, landscapes, location or aerial photography.

### Technical data:

Viewfinder camera for the 56 × 72-mm ideal format, adaptable to either the 120 or 220 roll film sizes for 10 or 20 exposures, bright-line view/rangefinder with automatic compensation for reduction of field size and parallax, aperture and shutter data for the follow-up-pointer exposure meter are visible in the viewfinder, combined shutter/film advance lever, double exposure prevention, "ready" indicator, adjustable anatomic handgrip with shutter release, 95-mm f 3.5 Linhof Technika lens, Synchro-Compur shutter 1 sec. to  $\frac{1}{500}$  sec. and B, XM synchronization via cable or "hot shoe", depth of field indicator, roll film inserts for rapid reloading.

Weight: 1650 g./58.2 oz.

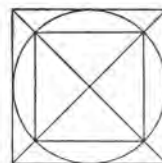
Colour: mat black

with a wide variety of assignments without the need for extensive accessories. The ideal-format negative or colour transparency permits a high degree of enlargement without loss of detail sharpness or detriment colour to fidelity or resolution. This is an important point wherever pictures have to be taken for commercial or semi-professional purposes. Block-makers always require perfect copy from which they can work with a minimum of trouble or expensive retouching.

The handgrip, which is attached close to the side of the housing and is provided with a shutter release button, contributes considerably to the convenience of operating the new Linhof 220 RS. Through turning the grip one can adjust the holding angle to the most comfortable position for any particular shot (Linhof patent). This enables one to balance the 220 RS firmly in one hand, which appears to make it even lighter than it actually is.

A camera for the press must be

## technical news



### Improved front standard rise for Linhof Super Technika 6 × 9

The well-known  $2\frac{1}{4} \times 3\frac{1}{4}$  in. Linhof Super Technika V has been improved with respect to the adjustment of the standard when using wide-angle lenses. Part of the camera housing can now be flipped back affording more space for the upward adjustment of,



especially, fast wide-angle lenses with their customary large rear element. This feature was previously only to be found on the Linhof Master Technika for the 4 × 5 in. format. This innovation will be particularly welcomed by architectural photographers, since the smallest camera of the Technika series has thus become even more universal.

### Technical specification:

Hand camera with coupled rangefinder, optical zoom viewfinder and anatomic grip incorporating shutter release; also features all the movements likely to be required in architectural and product photography. Further features: removable, revolving frame with international spring back, triple extension of drop-bed, right-angle mirror attachment, special bellows for focusing and taking exposure readings from the screen with conventional CdS exposure meter, magazine for 120 and 220 roll film as well as perforated 70 mm film in the formats  $2\frac{1}{4} \times 2\frac{1}{4}$  in., ideal format 56 × 72 mm and  $2\frac{1}{4} \times 3\frac{1}{4}$  in. (8 to 53 exposures), holders for sheet film, plates and Polaroid

film. A range of 100 top-class lenses from leading German manufacturers is available.

### Newly-designed Linhof Multi-purpose stand for a modest price

Nickel-plated, square-section steel column, brass rack-and-pinion drive designed so that it rises smoothly but is self-locking in a downward direction, outrigger adjusts horizontally thus providing for location of camera in one of three positions and an enlarged white baseboard—those are the main features of the new inexpensive multi-purpose accessory stand from Linhof.

The main advantages to be drawn from this kind of construction are an even further improved stability and yet a maximum amount of vertical travel by virtue of the rack-and-pinion with crank drive. The new stand is very convenient to operate on account of the free-running qualities coupled with a finely adjustable, automatic brake. Even when a heavy item of equipment is mounted, it is quite impossible for the outrigger to descend of its own accord the moment the lock is slackened off.

The camera-mounting plate of the outrigger can be moved out horizontally to one of three posi-





tions. This means that the distance between the column and optical axis can be altered, facilitating giant enlargements (resp. copying large originals) directly onto the baseboard. It also implies that apparatus of varying sizes can be mounted in a position so that they are directly over the centre of the baseboard. Should such measures not prove enough in the case of postsize enlargements, it is possible to revolve the column through 180°—after releasing a star-knob—and project onto the lab floor.

The mounting of a still camera, enlarger, cine or video camera is effected with the aid of several star-knobs on the outrigger plate; here the slit has been given an S-form to facilitate attachment of all manner of apparatus. This also means that the latter can be inclined at any desired angle. An additional safeguard against vibration is provided by a wall bracket which is designed to form a support between the top of the column and the wall.

There are four rubber-tipped, adjustable feet underneath the baseboard by means of which one can quickly align the stand parallel.

#### Technical specification:

Maximum height: (baseboard to camera mount) 132 cm/52 in.  
Maximum travel along rack:

109 cm/43 in.

Maximum reach (column to camera screw): 19.6 cm/7.7 in.

Minimum reach: 9 cm/3.5 in.

Baseboard, overall: 66 × 66 cm/  
23.6 × 26 in.

Working area on the baseboard:  
50 × 60 cm/19.6 × 23.6 in.

### Lighting unit for the Linhof "Varioport" copying stand

This accessory for the Linhof Varioport copying stand, which was introduced not so very long ago, is likely to appeal especially to the serious amateur and movie-maker. Also schools, universities and scientific research institutes will recognize the usefulness of this favourably-priced unit. The Linhof Varioport copying stand with the lighting unit has a wide field of application which ranges from reproduction work of a general nature to photomicrography with still, cine or video cameras.

The new illumination outfit consists of a frame made of aluminium section, which is easily and firmly attached to the Varioport

column, and two adjustable brackets, each fitted with two sockets for reflector-type lamps. The outrigger extending from the column is provided with an apparatus mounting plate which can be located in one of three different positions. In this fashion the copy camera may always be centred directly above even a large original.



This extremely rugged, space-saving and practical item of equipment can be set up on a table anywhere in the laboratory or studio. This means, on the one hand, that all manner of photographic apparatus can be attached to it and the lamps quickly aligned and, on the other hand, that work will be rapid and rational which is carried out on it.

Linhof Präzisions-Kamera-Werke GmbH, D-8000 München 70, Rupert-Mayer-Str. 45.

### Durst RCP 20, the first automatic continuous processing machine for the amateur darkroom

Durst has introduced the first colour paper developing machine for the home darkroom which functions along the lines of the continuous throughput processors to be found in commercial labs. The RCP 20, a compact table apparatus, employs rollers, has automatic temperature control and a constant transit time.

The machine can handle all manner of colour and black-and-



white papers (RC/PE) fully automatically. All conventional "high speed processes" are possible with the machine, since the different temperatures for each process may be set on a thermostat. The apparatus is also fitted with a pump for the developing bath, which guarantees a uniform and intense colour development. Automatic paper feed and daylight development increase the ease of operation. The machine is especially suitable for processing series of prints on account of a capacity of 45 photos in the largest format of 8 × 10 in./20 × 25 cm. When twenty 8 × 10 in. prints are fed into the machine continuously, the saving in time amounts to one hour in comparison to manual methods. Probably of greater importance for the amateur is the uniformity of the results obtained and the fact that no further checking operations are necessary.

#### Technical data:

Length 82 cm, width 42 cm, height 21 cm

operating voltage 220 volt

capacity: developing bath 2.5 litre

stop bath 0.4 litre

bleaching bath 2.5 litre

paper sizes are from 7 × 10 cm to 20 × 25 cm

width of the rollers 22 cm

transit speed 9 cm/min.

Distributor: Durst (USA) Inc., div. of EPOI, 623 Stewart Ave., Garden City, N.Y. 11530

### Hama bellows-type bottles for longer solution life



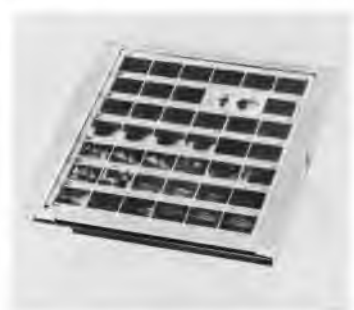
The bellows shape of the new Hama bottle permits it to be pushed together until the last scrap of air has been expelled. Since the chemicals no longer come in contact with air, their useful life is prolonged. This is particularly important with varying quantities of "vulnerable" colour developer.

Hama folding bottles are available with a maximum capacity of either 1000 ccm or 3800 ccm.

Colour of the plastic material: brown. We have also, at last, a lab bottle with a reasonably large opening for filling.

### Hama contact printer S

Anyone who still gets annoyed when the edges of film lifting up when making 35 mm and roll film contact prints, thus spoiling sharpness, will welcome the new Hama contact printer S. The film strips are simply clamped between two spring elements and the photo paper laid into the contact frame. Any enlarger can serve as a light source. The contact printer S can be supplied by Hama in three different models: 35/7 S for 42 miniature negatives, model 64/4S for 12 negatives 2¼ square and type 1824 for sheet film up to 8 × 10 in.



Manufacturer: Hama, D-8855, Monheim, Western Germany.

### Agfacolor 80 S Professional

With the introduction of Agfacolor 80 S Professional, Agfa Gevaert have extended their range of films for the commercial photographer. The new double-masked colour negative film (20 DIN/80 ASA) is to be supplied in 35 mm cartridges, as roll film and sheet film (all customary formats) in a silver packet with a red spot symbolising "daylight". Fine grain, high contour sharpness and harmonious colours of excellent saturation are characteristic of the Agfacolor 80 S Professional. This new film may be used successfully for a wide range of applications in professional photography, such as fashion or advertising, industry or product photography, not to mention portraits. Thanks to especially thin emulsion layers, scattered light is reduced and sharpness raised to a remarkable degree. A further advantage of the Agfacolor 80 S



Professional is that it can be developed in the normal Agfacolor negative process in all hanger-type machines at 20°C, also in a special Agfacolor one-shot rotary processor at 24°C within 30 minutes.

The new film is balanced for daylight or light sources of similar colour temperature (5500°Kelvin), particular value being laid on a favourable response to electronic flash illumination. When used with artificial light sources, a conversion filter CTB8 is necessary.

Agfacolour 80 S Professional in short:

- Colour negative film with 20 DIN/80 ASA rating
- Double masking
- Improved sharpness due to reduction of total emulsion thickness
- For fast shutter speeds down to a few seconds CTB 8 filter for artificial light (minus 1½ stops)
- Gradation softer than normal amateur colour film
- Especially balanced for optimum reproduction of skin tones with studio flash
- Development in tanks or one-shot rotary processors
- Normal Agfacolor process at 20°
- Special one-shot process at 24°C complete in 30 minutes
- All customary film sizes from 35 mm gauge up to 20.3 × 25.4 cm.

*Manufacturer:* Agfa Gevaert AG, D-509 Leverkusen.

## New Bowens reflector Type 84



The designation "84" refers to the size of the reflector which measures 84 × 84 cm. It is made of glass fibre reinforced polyester and is therefore extremely light but rigid. By means of various diffusing foils, the character of the light and its intensity may be influenced.

The large, flood-type reflector may be fitted to all Monolite compact flash units. In combination with a special flash head it may be adapted for use with other types of flash generator. The reflector may be mounted on any firm tripod via the 3/8 in. thread.

*Manufacturer:* Bowens Ltd., 72 Dean Street, London W IV 6DQ

## Betavaron 3...10/0.08, a Schneider zoom lens for enlarging from the 35 mm negative format

The Betavaron, recently made public by Schneider, is the first zoom lens for enlargers and printers.

The Betavaron makes feasible a number of applications which previously were inadequately fulfilled by conventional enlarging lenses. At a high level of image quality the lens greatly simplifies enlarging procedure and thus cuts down on the time required for such work.

Once the enlarger has been focused, prints of varying size can be produced without altering the distance between the negative plane and the easel; all one does to obtain a change in image scale is to adjust the lens. Appropriate scales on the Betavaron facilitate selection of the correct aperture and exposure time for a particular scale of enlargement, so that one can concentrate on the picture section without any preliminary, time-consuming calculations.

In view of the magnification ratios which the Betavaron can cover it is obvious that an enlarger with automatic focusing facilities is superfluous.

In printers the Betavaron can take the place of a whole series of fixed-focal-length lenses which were previously necessary to cope with constantly changing scales of enlargement. When the distance between the negative plane and the paper easel is fixed at 650 mm, enlargements ranging from 3 × to 10 × may be carried out with the Betavaron. With the aid of supplementary lenses, the scope may be extended to include the ranges 5.3 to 17 × or 6.3 to 20 ×. If a degree of enlargement outside this field is

required, one can still regard the Betavaron as a conventional enlarging lens and adjust the enlarger height. A series of special adapters is available for mounting the Betavaron on the majority of enlargers.

*Manufacturer:* Jos. Schneider & Co., D-6550 Bad Kreuznach, Postfach 947.

## CK 17 now available in Agfachrome quality

Agfa-Gevaert have altered the Agfacolor CK 17 single 8 and 16 mm cine film emulsion to the specification of the recently introduced and now well-proven Agfachrome Super 8. Although there will be no indication on the CK 17 packets of the improved quality, all future single 8 and 16 mm cine film will have the new Agfachrome emulsion which offers the following advantages in comparison to the old CK 17:

- Considerably improved colour rendition and differentiation in hue
- Excellent reproduction of all skin tones
- Optimum gradation curve; in spite of increase brilliance, the highlights and shadows show all important details

*Manufacturer:* Agfa-Gevaert AG, D-5090 Leverkusen.

## Extra charger for Mecablitz professional flash units

Metz can supply an apparatus Type B 25 for the external charging of accumulators from their professional range of electronic flash units, Mecablitz 402, 56/1 and 202. The 6-volt lead or nickel cadmium batteries may now be charged up independent of the flash unit and its built-in charging unit.



This is of practical interest especially for commercial photographers who are constantly using their flash gun; now he may have ready-charged replacement batteries at hand.

The empty battery is inserted in the charging device in the same fashion as in the battery compartment of the flash unit. On releasing the lid catch, the circuit is automatically broken. According to the type of battery and Metz unit, the charging time ranges between 5 and 18 hours.

## Power pack to convert Mecablitz flash units for studio use

The generator unit of the Mecablitz flash can be mounted and secured on top of the mains transformer N 20. The result is a well-balanced unit which is of advantage in any busy studio.

The following may be connected up to the N 20 power pack as desired: one Mecablitz 402, 56/1 or 202, one Mecablitz and up to six appropriate extra heads or even eight of the Mecatwin type. Assuming the telecomputer is switched off—hence full power—and accord-



ing to the number of units connected up, the recycling time lies between 5 and 20 sec. The effective guide number with maximum equipment in play is 113 for 21 DIN film/370 for 100 ASA. The power pack is electronically stabilized, that means that the light output remains constant irrespective of voltage fluctuations and number of flash heads attached.

Coupled up with the N 20 power pack, the easily transportable and powerful Mecablitz flash outfit becomes a versatile studio-type unit which is, none the less, modest in price. Of course, all the advantages of the computer-controlled exposure remain intact.

*Manufacturer:* Metz Apparatewerke, D-8510 Fürth, Bavaria. Further information from: EPOI, 623 Stewart Ave., Garden City, New York, USA.



## Honeywell develops automatic focusing for cameras

The photographic product department of Honeywell, Denver, USA, has been working on a project which will make automatic focusing for cameras commercially feasible for the first time. It is a case of a small solid state electronic component which Honeywell have called the Visitronic Auto-Focus. This Auto-Focus unit can be regarded as an important step forward in the electro-optical field, since it may be applied, equally well, to all manner of movie, video and still cameras. Such photographic apparatus could therefore now be made to function fully automatically from focusing to exposure.

Honeywell intends selling the Visitronic Auto-Focus components directly to camera manufacturers.

## Polaroid magazine for the Asahi Pentax 6 × 7



In keeping with a wish expressed by many owners of the Asahi Pentax 6 × 7 camera a firm in Switzerland has set about producing a Polaroid magazine. The set consists of a hinged back for the 6 × 7, a Polaroid magazine type 405, as well as a supplementary lens. Any Asahi Pentax 6 × 7 can be adapted for this magazine. A redesigned hinge permits one to change the back. In this new Polaroid magazine for the Pentax 6 × 7 one can use the Polaroid films 105, 107 and 108. The picture format measures 55 × 70 mm.

Further information from: Weinberger Gewerbehäus, CH-8005 Zürich, Förlibuckstr. 110.

## Cosar Densitometer for process control

The Texas Cosar Corporation has extended its range of measuring apparatus for professional labs.



The Cosar 55 and Cosar 45 are fitted with the special status filters stipulated by Kodak for process control purposes. The most modern circuitry incorporating semiconductors and digital readout form a sound basis for reliable, uniform and economical working methods in process control. Various combination equipment is likewise included in their programme. All these instruments have stood up to a series of tests in the Kodak laboratories in Rochester, USA. This is an essential precondition, since Kodak itself no longer produces these narrow-band status filters and have also withdrawn from the marketing of appropriate measuring instruments. This gap has now been filled by Cosar as the manufacturer of the above-mentioned apparatus and filters.

Manufacturer: Cosar Color Controls inc., 3121 Benton Street, Garland, Texas 75042, USA.

## Wind machine for professional studios

This is a mobile wind machine on a special stand, the casters of which can be locked to keep it steady



when in operation. The 220-volt electric motor is fully enclosed. The heavy-duty ventilator runs in a cylinder of 43 cm diameter. The strength of the wind can be steplessly altered by means of a resistance and its direction adjusted horizontally and vertically. The head of the machine can be set at heights varying between 0.5 and 1.9 m.

Studiotechnik W. Hensel KG, D-8700 Würzburg/Lengfeld, Friedrich-König-Strasse.

## Multiblitz Mini Spot 200

The built-in special reflector in this compact unit provides genuine spot effects. Two power stages as well as a proportional modelling light (12 volt 50 watt halogen) permit the spot to be adapted for all manner of lighting set-ups and incorporation in any available studio flash equipment. Impulse-type photo cell, tripod mounting brackets, rapid recycling time of 1—2 sec. and simple operation are



further features of this compact spot. The small dimensions of the Mini Spot 200 (23 × 12 × 12 cm) enable one to use it for finely-dosed light effects on even a table top arrangement in the studio. A set of accessories, consisting of barn doors, six colour filters a snoot and honeycomb screen, extend the scope of the spot.

Manufacturer: Multiblitz GmbH & Co. KG, D-5050 Porz-Westhoven.

## SLG 1000 Osram safety lamp with blower

Osram's new SLG 1000 is designed for safe, continuous operation. Whilst the blower is left running, the lamp can be switched off and on as required. The conception and electrical specification of the lamp conform to the German safety regulations VDE, e. g. a thermostat switches off the lamp should it



become overheated. A guard shield of safety glass curves inwards protecting the 1000-watt Superphot halogen lamp as well as the reflector. Since the cooling motor is of the low-voltage type, it was possible to retain the handy size of the SL 1000.

Optimum light output, excellent colour quality as well as even illumination over a broad field are characteristic of this lamp for still and movie photography. To achieve indirect illumination, it is possible to swivel the lamp head through 90 degrees.

Manufacturer: Osram GmbH, D-8000 München 90, Hellabrunner Str. 1.

## New developing tanks from Kaiser

Kaiser presents three new hand developing tanks. Standard, Universal and Mini, not only in a pleasing design but also with two important features:

1. The lid incorporates a special sealing ring which is absolutely water-tight and only needs to be pushed on
2. A ring-shaped vent which permits rapid emptying of the tank; attention to the position of a conventional emptying spout is not necessary

These operational advantages are supplemented by an easy-to-use loading device for the transparent film reels. The housing and



A wonderful portrait by the German photographer Mark A. Mender, Munich. ▶











the reels are made of resilient and heatresistant plastic. The moulding of the new Kaiser developing tanks (4260 S, 4261 U and 4262 M) prove that it is perfectly possible to combine necessary technology and simple handling in an aesthetic exterior.

**Manufacturer:** Kaiser Foto-technik KG, D-6967 Buchen/Odw., Postfach 6.

### Fine grain developer in tablet form

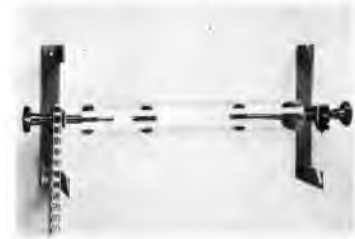
Amateur lab fans will be bound to welcome the new P<sup>0</sup> negative developer. The 2 × 3 tablet packages of this Italian-made phenidone hydroquinone developer facilitate making up. Six tablets (3 × A + 3 × B) provide 900 ccm of fine grain developer; this is a quantity which is enough for even the largest tank. According to the type of film and speed rating the developing time ranges between 8 and 11 minutes. Negatives processed in P<sup>0</sup> negative developer exhibit fine grain and good sharpness. Even pushed processing does not bring about any appreciable clumping of grain.

**Manufacturer:** Condor-Foto, Milan, Italy.

### Practical and low-priced background winding gear

At last there is a really inexpensive background support for rolling up background paper on cardboard tubes; this may also be used for paper with no core or rolls on aluminium axles. The components are largely made out of substantial nylon material, hence light and resistant to wear. An interesting and practical feature is the different colours of the chains which are available in red, black and grey in order to help rapid selection of the right roll.

**Distributor:** Deutsche Durst GmbH, D-2000 Hamburg 60, Bramfelder Strasse 102.



### "Flip-Top" packets for Ilford films

The extremely practical idea of Ilford to provide their 35 mm and roll film boxes with a flip-top is a further simplification for the consumer in loading his camera with film. Light upward pressure of the thumb at the top of the pack is sufficient to reveal the film (fig. 1). After removal of the well-proven moisture-proof envelope (fig. 2) one is surprised to find a roll film with a sealing band plus "tongue" (fig. 3). Only one further step (fig. 4)—which can also be carried out with one hand—and the end of the film leader is ready to be inserted.



The moral: it is well worth while giving attention to even the smaller details!

### A light-tight dispenser for photo paper

The majority of photographers have been troubled at some time or other by the problem of where to keep photo paper so that the right sheet is immediately available. The Kindermann paper dispenser is a light-tight and convenient solution to this problem. It is made of chemically resistant plastic and the two drawers can accommodate up to 200 sheets of paper in formats from 5 × 7 in. up to 8 × 10 in. On opening the drawer a sheet of paper is automatically pushed forward.

The dispenser is absolutely impervious to light and, by means of the self-acting spring, the front flap closes again after removing the sheet. Four plastic feet ensure the dispenser does not slide. Four



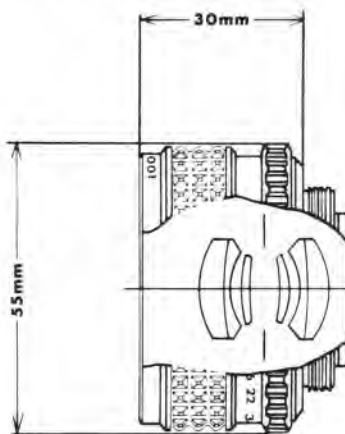
sides of the housing have been provided with grooves so that several units can be joined up together.

**Manufacturer:** Kindermann & Co. GmbH, D-8703 Ochsenfurth, Postfach 28.

**Distributor:** EPOI, 623 Stewart Ave., Garden City, N. Y. 11530.

### Medium-format enlarging lens from Minolta

From a range of new enlarging lenses introduced by Minolta the 80 mm f 5.6 C. E. Rokkor is suitable for colour enlarging up to a negative format of 6 × 9 cm/2 1/4 × 3 1/4 in. Naturally, this special lens is also suitable for black-and-white work. The lens system features optimum correction of chromatic aberration through the use of a special sort of flint glass.



When the enlarger lamp is switched on, the selected aperture value appears illuminated in two opposing windows. It is possible to override the click stops of the diaphragm if one desires to finally set an intermediate value. The 80 mm C. E. Rokkor is provided with a Leica thread and can therefore be fitted to practically all enlargers.

#### Technical specification:

80 mm f 5.6 orthometric process lens for formats up to 6 × 7 cm

Optical system: 6 elements in four groups

Coating: amber and magenta colours

Two aperture scales: 5.5, 8, 11, 16, 22, 32, 45

Interchangeable mount: Leica thread

Dimensions: 55 mm dia. by 37.8 mm

Weight: 155 g

**Distributor:** Minolta Corporation, 200 Park Ave., New York, USA.

### Schiansky light barrier 620

For all those fields of photography where it is the task of the subject itself to trip the shutter, Schiansky



has developed a self-acting light barrier type 620. It consists of a light wave receiver and emitter. The latter incorporates a gallium arsenite diode which is resistant to shock and vibration and has an unlimited service life. The invisible infra-red light has a wavelength of 900 nm. A built-in filter permits the receiver to react *only* to infra-red light. When the infra-red rays of the light barrier are interrupted, the camera, either still or cine, is released. At the same time an indicating diode of the control unit lights up. By means of a knob one can adjust the length of time for which the circuit is to remain closed. In this way it is possible to run a movie camera or shoot a series of single photos throughout a period ranging from 0.5 to 10 sec. The emitter and receiver are connected up to the control unit by means of cables with five-pin DIN standardized sockets. The two units may be attached via a 3/8 in. thread to the tilt head of a tripod, which greatly facilitates alignment.

Apart from the input cables mentioned and the power supply (battery box 621) one also finds, on the control unit, output terminals for the Teleknips 601, the flash unit and a socket for apparatus with remote electric release.

Cameras which are only fitted with a normal cable release may be

Veteran vehicles are gaining in popularity. Tony Craddock/Tony Stone Associates, London, used the largest possible format, 8 × 10 in., in order to capture the finest detail. The results certainly warranted the extra trouble.



triggered by means of the Schiansky remote control unit 605 which is actuated by the light barrier.

Further enquiries to: Schiansky, D-8000 München 90, Schliersee-strasse 71.

## Hähnel viewer/editor model VB 214 for Super 8 film

The VB 214 Hähnel film editor is fitted with the V-channel system which is kind to one's film: the film is advanced in a V-shaped channel through contact only at the outer edges. Scratching of the film is thus avoided. Through the following automatic features operation has become simpler:

On pressing a button, the film slips into the V-guide. If one wishes to skip over a scene in order to find a particular place again, one switches over to rapid reverse. The change of scene is then still visible on the viewing screen. It is thus possible to find the desired place very quickly and without damage to the film. On shutting the film automatic device again, normal viewing is continued—all of which takes place without having touched the film a single time.



**Technical specification:** Blue-coated, colour corrected 11 x 14 cm fresnel lens, film-saving V-system, 180 m reel capacity, micrometric focusing, lateral picture centering, frame marking punch, 6-volt, 10-watt lamp, alternatively halogen lamp.

**Distributor:** Allied Impex Corp., 168 Glen Cove Road, Carle Place, New York, 11514.

## Rollei introduces a new line of Super 8 movie cameras

- Rollei Movie 4 Macro Zoom
- Rollei Movie 6 Macro Zoom
- Rollei Movie 8 Super Zoom

The progressively more sophisticated specification of the new Super 8 movie cameras take into

account the increasingly exacting demands in the field of amateur movie making; they offer the hobby cameraman, as well as the semi-professional, considerable creative scope for realizing his own personal ideas.

Good design, handiness and convenience of operation as well as great versatility are the advantages of the new range of cameras;

- Modern silver-black styling with clear, well-arranged operating controls
- Electromagnetic release for shake-free shooting
- Macro switch for unusual close-ups of small objects (Rollei Movie 4 and 6)
- Folding handgrip for transport
- High-quality lenses with well-graded zoom ranges (4 x, 6 x, 8 x) and a choice of two zoom speeds (Rollei Movie 6 and 8)
- Exact and fully automatic through-the-lens CdS exposure measurement also backlight control or manual selection of aperture
- Automatic fade-in fade-out (Rollei Movie 6 and 8) lap dissolve for professional-type change of scene (Rollei Movie 8)
- Sound socket for lip synchronization (Rollei Movie 8)
- Remote control socket
- Facilities for single frame and slow motion, flash contact (Rollei Movie 6 and 8) as well as a number of other advanced technical features.

### Technical specification:

Rollei Movie 4 Macro Zoom, a Super 8 movie camera with 4 x macro zoom lens: 8—32 mm f 1.7 Rollei Macro Vario; focuses from infinity to approx 1 m or to the leading edge of the lens when set to macro. Parallax-free, reflex viewfinder with micropism, aperture data visible in viewfinder with warning marks for over or under-exposure, prescription lenses from + 1.5 to — 3 diopters; eyecup.

Exposure measurement: fully automatic through-the-lens CdS exposure measurement with manual override; backlight control approx. 1 f-stop; shutter speeds: 18 fps, single frame and slow motion of 36 fps; power source of four 1.5-volt batteries (e.g. Mallory MN 1500) sufficient for approx. 10 films; battery test; electromagnetic release; remote control socket; automatic setting of film speed rating from 16 to 160 ASA;



film counter with automatic viewing; film type indicating window. Folding handgrip with built-in battery compartment (circuit interrupted when in folded state); hand-strap, 1/4 in. tripod thread; filter thread M 58 x 0.75; dimensions: 223 x 183 x 60 mm; weight: 1225 g.



**Rollei Movie 6 Macro Zoom:** Basic specification same as for Rollei Movie 4 with following extra features: 6 x zoom range, two motorized zoom speeds, fade-in/fade-out as well as flash contact for single frames. Lens: 8—48 mm f 1.7 Rollei Macro Vario; shutter speed: 18 and 24 fps; slow motion at 48 fps as well as single frames. Dimensions: 223 x 183 x 60 mm; weight: 1250 g.

**Rollei Movie 8 Super Zoom:** Specification same as for Movie 4 and Movie 6 but with the following differences: 8 x zoom, no macro facility, fully automatic lap dissolve, swing-in grey filter and socket for lip synchronization. Lens: 7.5—60 mm f 1.7 Rollei Vario, 4 x grey



filter: focusing from infinity to 1.5 m; shutter speeds 18/24/48 fps; single frame, slow motion at 48 fps. Dimensions: 247 x 183 x 66 mm; weight 1300 g.

**Manufacturer:** Rollei-Werke Franke & Heidecke, 33 Braunschweig, Postfach 3365.

**Distributor:** Rollei of America Inc., 100 Lehigh Dr., Fairfield N.J. 07006.

## Rollei P 830 silent projector

## Rollei P 840 T sound projector

Two new projectors for Super 8 film have been introduced by the Rollei works of Franke & Heidecke. They represent a continuation of the well-proven Rollei series of projectors P 83/P and 84 P.

The functional controls on both projectors are well arranged, facilitating operation. They are of pleasing design, finished in black and have an advanced technical specification.

- Automatic threading and film take-up
- Zoom projection lens
- Brilliant level of illumination with low heat development due to cold-mirror quartz halogen lamp
- Lamp economising circuit
- Still and reverse projection
- High-speed rewind
- Central switch for all functions
- Operating voltage selector
- Height adjustment
- Handle for easy transport.



### Technical data:

#### Rollei P 830:

Film projector for gauges Super 8 and Single 8. Lens: f 1.5, 16.5 to 30 mm; 12 volt, 75 watt, cold-mirror halogen lamp with economizing circuit; slow motion, forwards and reverse projection (via central switch); adjustable 16 to 24 fps or slow motion approx 8 to 12 fps; reel capacity 120 m; mains



voltage selector; dimensions: 29.5 × 17.5 × 23.5 cm; weight: approx. 5 kilos.

### Rollei P 840 T:

Sound projector for Super 8 and Single 8 movie film. Lens: f 1.3, 16.5 to 30 mm zoom lens; 12 volt, 100 watt, cold-mirror halogen lamp with economy circuit; forwards and reverse projection selected via central switch. Range frequency 18 or 24 fps selected by means of lever; reel capacity without sound track 180 m, with sound track 157.5 m; automatic threading and film take-up, high-speed rewind for repetition of scene; mains voltage selector; magnetic recording and playback.



#### Frequency range:

80 to 8000 Hz/cps at 18 fps  
80 to 10000 Hz/cps at 24 fps

Automatic sound level adjustment, trick facility for superimposing a second sound signal on track already recorded; attenuation of first sound track and level of second recording may be infinitely adjusted. Indicating lamp shows sound is "on".

6 watt sine amplifier output; built-in test loudspeaker, socket for external loudspeaker; socket for mike or other input sources.

Dimensions: 29.5 × 17.5 × 23.5 cm  
Weight: 7.4 kilo

**Manufacturer:** Rollei Werke Franke & Heidecke, 33 Braunschweig, Postfach 3365.

**Distributor:** Rollei of America Inc., 100 Lehigh Dr., Fairfield N. J. 07006.

### Cima Techno-Tronic CT 10—a novel light for TV reporting

This is an electronically-regulated battery-type lamp which may be charged up again within one hour. It incorporates features for which many cameramen have long clamoured:



- Uniform colour temperature of 3400 °Kelvin (6000 °K with filter)
- Even distribution of light over entire field
- Burning time of between 30 and 50 min.
- Acceptable drop in colour temperature  
approx. 100 °K after 30 min.  
200 °K after 40 min.  
300 °K after 50 min.
- Low charge cut-off (impossible to discharge battery completely)
- Electronic voltage and temperature control
- Electronic/mechanical control of charging time (overcharging not possible)
- Charging time maximum one hour.

The light may be focused and is fitted with a 24-volt 250-watt quartz halogen lamp (G 6.35 base), barn doors, wire gauze filter and various effect discs are available as an extra. The service life of the 24 volt/10 AH nickel cadmium batteries is five years, respectively, approx. 500 charging cycles. The Cima Techno-Tronic CT 10 is a robust and reliable lamp with simple handling qualities.

**Manufacturer:** Cima International, 8510 Fürth, Bussardstr. 19.

### New reel for endless projection of continuous loop 16 mm film

Reels for the continuous projection of cine film are, in principle, not all that novel, but have been included in the programmes of certain



manufacturers for some time now. -bke-Bildtechnik have developed a new conception of such a reel for continuous loop film, although the basic principle remains the same. The most interesting feature of the new spool is its simplified attachment to the projector. It was designed principally for use in conjunction with the Bell & Howell 16 mm projector. It can be mounted on the top handle of the latter very simply without tools by means of two plastic screws. Attaching takes only a matter of two to five minutes at the most.

With appropriately adapted parts, the new reel can be mounted equally simply on many other types of current 16 mm projectors. On ordering, the exact make and model of projector should be quoted.

To protect the attached reel from dust, a transparent plastic cover is also available.

**Manufacturer:** "-bke-Bildtechnik", D-3412 Nörten-Hardenberg, Burgstrasse 3.

### Noris Norisound magnetic sound film projector with marginal track

The particulars of this new cine projector are:

- Fine adjustment of the balance between the music and speech sound levels
- On recording, modulation is automatically controlled by a button on the microphone; it is thus no longer necessary to operate the "trick button" during the recording.
- In the case of trick recordings the Noris Norisound 110 remains switched to "playback" (one hears the first recording) until the microphone button is pressed; the switch-over takes place electronically.
- To facilitate choice of music, it is possible to play an outside tape recorder through the projector loudspeaker
- Possibility to make announcements whilst the projector is at a standstill—also possible during a sound film performance
- During the projection of a silent film or whilst rewinding all types of film, there is no pressure on sound head, thus preventing wear.
- Further technical data: 15—25 mm f 1.3 lens, automatic reel-to-reel threading, 180 m reel

capacity, electronically controlled speeds of 18 and 24 fps, 12-volt, 100-watt cold-mirror halogen lamp, central switch for forward and reverse projection—whilst in reverse, the projection lamp may be switched off. High-speed rewind, external voltage selector for all conventional mains voltages at 50/60 Hz.

- Built-in loudspeaker with 6-watt sine continuous output, recording "ON" signal, standard input sockets for microphone, radio, record player and output socket for extension speaker. Volume control, automatic modulation, trick control, frequency range 60—10,000 Hz at 18 fps; special microphone, re-recording cable and 180 m take-up reel.

### Noris Norisound 120

With its 20-watt music output (15 watt sine) the Noris Norisound 120 permits really professional cinema performances even in larger rooms. On account of the "recording light" switch the full power of the 12-volt cold-mirror halogen lamp can be cut to 8.5 volt. This results in 40% less heat at the film gate.



The service life of the lamp is also considerably increased. For a small, test projection screen the 8.5 volt illumination is perfectly adequate.

With the aid of the fade out/in feature it is possible to mix music perfectly—similar to dissolves in the visual medium. The four-digit film counter is in synch with the pictures and functions absolutely free of slip; it advances after every third frame and can be brought back to the zero position at any time.

The clarity of all operating controls is further enhanced by the illuminated mixing disk. Otherwise, the Noris Norisound 120 has the same specification as the Norisound 110.



## Noris 8000 sound camera with recording microphone

Lens: 5—60 mm f 1.7 zoom lens, motorized zoom action or manual.

Viewfinder: reflex viewfinder with microprism rangefinder, warning marks for over and under-exposure, film transport check with "end of film" indicator. Visual signal for fade-in/out, eyepiece adjustable over range of + 2 to - 4 diopters, green LED indicates sound recording.



Metering: fully automatic CdS exposure measurement through the lens, also manual setting, aperture range from f 1.7 to f 22, exposure may be corrected within  $\pm 1$  f-stop, additional backlight control, swing-in grey filter.

Daylight film speed ratings from 24 to 100 ASA. For artificial light—between 40 to 160 ASA—camera is adapted either by sliding out the daylight filter or screwing in a movie light. Running speed 18 fps, battery check for film drive and metering. Film counter in metre and feet, automatic resetting to zero after removing cassette. Input for remote control, microphone and headphones as well as for charging battery.

### Sound system

Sound amplifying circuit: 8 transistors, 5 diodes with automatic modulation, film speed 18 fps keeps constant on account of governor-regulated motor. Maximum input signal: monitoring sound level switch may be set to either H = 3 mv or L = 10 mv. Sound may be monitored during a recording by means of headphones with an impedance of 600 Ohms. A green check LED then appears in the viewfinder.

Sound amplifying switch: the level of the sound recording can be set to H (normal or high) or L (low). This function can also be checked by the green light in the finder and

the adjustment can be listened to via the headphones.

Microphone: a normal microphone is supplied; an omnidirectional mike with an impedance of 200 to 600 Ohm is available as an extra. The microphone switch may also be used as a means of starting the camera remotely.

## Noris 5000 XL sound camera with recording microphone



Lens: fast, f 1.2 8—40 mm zoom lens. Enlarged, 220°-shutter opening permits shooting under low light conditions. Aperture range from f 1.2 to 22; from f 22 a grey filter automatically swings in place to prevent overexposure.

Other details as for Noris 8000. Europe: Noris Projektion GmbH., 8500-Nürnberg, Hohlfederstr. 40.

USA: Karl Heitz, Inc., 979 Third Ave., New York, N.Y. 10022.

## Canon 310 XL

This is the first pocket-size Super 8 movie camera to possess a triple zoom lens with the extremely fast initial aperture of f 1. The latter has a high-performance, 13-element system which, together with the



220°-shutter, permits shooting under very low light conditions.

*Technical specification of the Canon 310 XL*

8.5—25.5 mm f 1 zoom lens with 13 elements in 11 groups. Shortest focusing distance 1.3 m. Set at macro position one can close in to 12.7 cm measured from the front lens. Range scale with two snapshot marks at 3 m and 10 m/9.8 and 3.32 ft. Lens zooms with motor running; filter diameter 43 mm.

Parallax-free viewfinder with large exit pupil, incorporates under-exposure warning, film transport indicator, battery check as well as macro warning light. Eyepiece may be adjusted for - 4 to + 2 diopters, built-in eyecup. External exposure measurement by means of CdS photo cell; aperture range from f 1 to f 45; film stock from 24 to 250 ASA; backlight control of 1 to 1½ apertures by means of slide. Built-in colour conversion filter is cancelled again when daylight cartridge is loaded.

Shutter speed 18 fps and single frame; mechanical release; 220°-shutter opening; common power source for film drive, exposure control and lens zoom: two 1.5-volt penlight cells. Housing has folding handgrip and battery test. Connection for cable release; self-cancelling film counter; ¼ in. tripod socket; cartridge compartment opens at side; main switch and integrated carrying strap.

Accessories: plastic case, filters and lens caps, 30 cm or 50 cm cable release, wide-angle attachment for focal length of 5 mm.

Distributor: Bell & Howell Co., 7235 North Linder Ave., Skokie IL, 60076.

## The Sankyo electronic generation

The Sankyo ES electronic movie cameras now offer also the amateur cinematographic possibilities which were previously restricted to the expensive profi cameras. In view of their comprehensive accessory system they also come up to professional expectations.

### Technical data:

The sharp, 12-element 8.5 to 35 mm Sankyo zoom lens (also 11—33 mm) has either manual or motor-driven zoom movement. The latter takes only four seconds to travel from wide-angle to the telephoto position. Automatic TTL



exposure measurement; manual control of the diaphragm is also possible; 220°-shutter opening; indicator for over or under-exposure visible in viewfinder. Shutter speed 18 fps; model ES 44 also has slow motion at 36 fps (it is possible to switch over to the latter whilst shooting). Film transport indicating lamp is visible in viewfinder; large reflex finder with adjustment of  $\pm 3$  diopters; built-in colour correction filter, folding handgrip incorporates battery compartment, sockets/provision for: lighting unit, tripod, tape recorder, electronic flash.

Accessories include electric remote release (cable length 4.5 m), self-timer can be adjusted from 5—60 sec. and interval timer for trick shots (0.5—60 sec.), radio control with transmitter and receiver.

## Optical lap dissolve for Sankyo Super 8 cameras with macro-focus adjustment

As in the case of professional cine cameras, optical lap dissolves are now possible with Sankyo Super 8 cameras of the MF series.

It is only possible to carry out a limited length of fade-out through running a film back into the cartridge, whereas any length of dissolve is possible through optical means. Through progressively drawing the plane of sharpness towards the camera, a subject at





infinity is caused to vanish. The system for the optical fade-out is incorporated in the zoom lens so that, as it is zoomed by hand, the zone of sharpness can be located, either abruptly or slowly, immediately in front of the lens. This process of optical lap dissolve can be observed in the viewfinder, just as it will appear on the projection screen later.

The Sankyo MF models are supplied complete with a macro-compensum title kit which consists of the macro-compensum—which is simply pushed on to the lens shade—five coloured title slides and four compendium masks.

## New Sankyo Super 8 sound projector

In designing its latest Super 8 cine projector, the "Sound 600", the Sankyo Company was able to draw on many years of experience. The projector is provided with a very sophisticated projection part with electronically stabilized motor, as well as a sound section which leaves little to be desired. The projector has been designed with a view to simple operation. It has automatic reel-to-reel threading.



Owing to the built-in mixing facilities sound movie-making on Super 8 film is no problem with the Sankyo Sound 600.

Providing the projector with a sound-modulating element and manual override permit one to add sound of professional quality. When the projector is switched to silent projection, the sensitive sound head is raised from the film, which reduces wear on the head as well as the film.

The sound reproduction at the upper frequency range is 10,000 Hz from a 4-watt amplifier. There are sockets for an external loud-

speaker as well as follow-up amplifier. For adding music the sound 600 offers a clearly-arranged mixing disk with central switch for forward projection (sound or silent) and reverse (also with visible image).

### Further technical data:

Fast rewind from reel to reel; modulating control instrument illuminated, safety keyboard for exact tone on/off; 12-volt, 100-watt cold-mirror halogen lamp; 15—25 mm f 1.4 zoom lens.

*Distributor:* Sankyo (America) Inc., 149 5th Ave., N.Y. 10010.

*Europe:* Hähnel GmbH., D-5042 Erftstadt-Liblar, Hubert-Rüttger-Str. 51.

## Elmo 600 S, a new Super 8 direct-sound movie camera

*Technical specification of the Elmo 600 S:*

- Camera type: action sound camera for Super 8 direct recording and silent films.
- Lens: 8—50 mm f 1.8 Elmo Zoom, motorized zoom travel takes five seconds (or manual override), focusing down to 1.5 m.
- Exposure measurement TT1 system with automatic CdS exposure control, diaphragm may be set by hand for shooting against the light and special effects, film speed ratings between 25 and 100 ASA (or ASA 40—160 for artificial light) are automatically taken into account, 85 A conversion filter is built in.
- Viewfinder: bright, flicker-free reflex viewfinder for obtaining an image which is free of parallax and corresponds to the actual focal length in use. Focusing via split-image rangefinder, aperture data as well as warning marks for over and under-exposure visible in finder. Indicators for "end of film" and



"sound recording" by means of LEDs, prescription glasses from — 3 to 1 diopter.

- Film transport is constant at 18 fps (sound as well as silent) through electronically-controlled and regulated motor, automatic film length indicator, powered by 6 penlight batteries or 9-volt powerpack; runs extremely quietly.
- Sound system incorporated IC amplifier with automatic sound level adjustment, may be switched to normal or reduced sensitivity for suppressing background noise, recording level indicator (LED) visible in finder, distortion and drag-free start/stop of sound recording, monitoring of the sound recording through headphones, battery: 6 volt Mallory PX 28.

Further details: sockets for microphone, remote control, earphones, power supply, monitoring knob, battery test.

Dimensions: 203 × 77 × 220 mm  
Weight: 1.6 kilo without battery  
Extras: eyecup, lens shade, capacitor microphone, extension cable for mike, powerpack with nickel cadmium accumulator and charger, remote control, shoulder strap, carrying case, lighting unit and brackets for latter.

## Elmo K 100 SM multi-format projector

Elmo have introduced to the competitively-priced amateur market a multiformat projector with the designation K 100 SM which incorporates well-thought-out technical features in pleasing styling.

### Technical specification:

- 12-volt, 100-watt cold-mirror quartz halogen lamp
- Variable projection speed 14 to 24 fps
- Automatic threading and film take-up
- Flicker-free slow motion reduces the recorded speed by one third, e.g. from 18 to 6 fps without reduction in screen brilliance or interruption; infinitely variable from 4—8 fps
- 15 to 25 mm f 1.3 zoom lens, forwards and reverse projection either with or without light, at normal speed as well as in slow motion
- Still projection and high-speed rewind
- May be switched over by means of lever from super 8 to double-run 8 mm

- Simultaneous start for tape recorder for non-synch background sound
- Further details: reel capacity 120 m, hinged lens mount, large focusing knob, central switch for forwards, reverse projection and lamp, driven by



DC motor, film cutting device, dimensions 290 × 185 × 235 mm with reel swung in, weight 6.5 kilo.

*Manufacturer:* Elmo Co. Ltd., 6, I-chome, Kamiho-dori, Mizuhoku, Nagoya, Japan.

*Europe:* AIC Fototechnik GmbH, D-7000 Stuttgart 81, Postfach 81 01 26.

## Hähnel motorized, cement-type film splicer "Auto-Kollmatik"

In the design of the Hähnel motorized film splicer close attention was paid to simple operation and high precision of the cemented joint.



### Technical data:

Motorized, cement-type film splicer with automatic film threading for Super 8 movie film; double sided scraper, cutting and cementing without turning over film; driven by 3 volt/6000 rpm electric motor; exact cutting on frame line, 1.3 mm joint, position of the joint corresponds to DIN 15853; automatic-opening pressure arm, power source: two 1.5-volt cells.

USA: Allied Impex Corp., 168 Glen Cove Road, Carle Place, N. Y. 11514.



# AGFACOLOR 80 S Professional

a new film—not only for the “Pros”

Agfacolor 80 S Professional is a double-masked colour negative film of high acutance for the production of colour paper prints and transparencies. The film is balanced for exposure by daylight, electronic flash or blue flash bulbs and is destined, in the first place, for the professional user.

## Identification

Silver box printed with “Agfacolor 80 S Professional” and the red colour circle, the symbol for colour negative film balanced for daylight.

Silver interior packing; roll film and 35 mm cassettes sealed in foil. To unpack the sealed films, the centre joint running round the envelope is raised at the corner and ripped open in an oblique upward direction.

Inside their boxes, sheet films are contained in black, airtight envelopes with plastic-coated aluminium foil lining. 35 mm guage film is marked between the perforation and the edge of the film “Agfacolor 80 S” and then comes a four-digit emulsion number. After the two prescribed blank frames, each exposure is consecutively numbered (two numbers per 24 × 36 mm frame).

Roll films bear the designation “Agfacolor 80 S” and a four-digit emulsion number. All films exhibit an arrow at the edge to facilitate identification of the emulsion side. On sheet film, in the top right-hand corner, there is a double notch indicating the emulsion side is towards you.

## Photographic characteristics:

Speed: rated at 80 ASA/20 DIN

Power of resolution (with high-resolving lens):

Yellow layer: 100 lines/mm

Magenta layer: 60 lines/mm

Cyan layer: 25 lines/mm

## Reciprocity law response:

Balanced for an exposure time of  $1/125$  sec.; no noticeable deviations within a range of  $1/1000$  sec. to 1 sec.

**Colour density curves:** Agfacolor 80 S Professional is especially suitable for the faithful reproduction of skin tones on account of its carefully balanced yellow emulsion layer and due to the nature of the density curve in the higher region.

## Film coating and sensitization

Film base: safety film support of cullulose acetate (according to DIN 15551).

Thickness: 0.13 mm for 35 mm guage, 0.10 mm for roll film and 0.20 mm for sheet film.

### *Schematic build-up of the emulsion:*

| Sensitized for colour components                                   |                  |         |
|--------------------------------------------------------------------|------------------|---------|
| Top coating                                                        | blue             | yellow  |
| Yellow filter layer                                                | colloidal silver |         |
| Middle layer 2 with yellow mask<br>Middle layer 1 with yellow mask | green            | magenta |
| Red filter                                                         |                  |         |
| Lower layer 2 with red mask<br>Lower layer 1 with red mask         | red              | cyan    |

The individual layers are separated by protective coatings. Total thickness of the emulsion amounts to about 1.99. Anti-halation backing: special colloidal silver suspension between the base and emulsion layers. There is also a “red filter” between the magenta and cyan layers in order to prevent a reflection of cyan light and improve the acutance of the film generally.

## Exposure

Suitable illumination sources are daylight, electronic flash or blue flash bulbs (corresponding to about 5500 °K) and Xenon light. Also possible are Nitraphot lamps of 3100 °K and halogen lamps of 3400 to 3600 °K provided a conversion filter CTB 8 is used (loss in speed rating of 1½ f-stops).

**Use of filters:** copying filters are used at the positive printing stage to obtain neutral colour enlargements. Filters are therefore not required at the exposure stage with the exception of

Some examples of the good restitution of colour with the new film Agfacolor 80 S Professional.

Photos: Dag Kempe, Foto International.



TEST



AGFACOLOR  
80 S









## AGFACOLOR 80 S—a new film ...

the CTB 8 in conjunction with artificial light. When shooting at high elevations or along the sea coast, a colourless UV filter is recommended. A polarization filter may be used to cut down reflection or for special effects.

### Processing

**Darkroom illumination:** either complete darkness or Agfa G 4 safelight filter with 15 watt bulb not closer than 30 inch.

**Development:** The film is designed for development in hanger-type processors at 20 °C. Handling in one-shot rotary processors at 24 °C (of the Colenta type) require, on account of the vigorous laminar flow and the increased exposure to the air, different times at each stage. The results obtained with the latter are not inferior to the immersion-type developing tank. Absolute coordination is not possible to achieve, however.

| Agfacolor solution                                                | abbrev. | Processing times |          |      |              | Yield per Liter without regen.                                              | Storage life |
|-------------------------------------------------------------------|---------|------------------|----------|------|--------------|-----------------------------------------------------------------------------|--------------|
|                                                                   |         | Tank             | rotation | Min. | °C           |                                                                             |              |
| Film dev. S                                                       | NPS I   | 8 <sup>1</sup>   | 20±0.2   | 5    | 24±0.2       | 120 7 films<br>35 mm 6 films<br>4 × 5 in.                                   | 6 weeks      |
| Intermediate bath for neg. film add 30 ml NPS or 20 ml RNPS per L | NZW     | 4 <sup>2</sup>   | 20±0.5   | 5    | 24±0.5       | sheet film 30 sheets<br>120 7 films<br>35 mm 6 films<br>4 × 5 in. 30 sheets | 6 weeks      |
| First wash (intensive)                                            | —       | 14 <sup>3</sup>  | 14—20    | 5    | 22—24        | — —                                                                         | —            |
| Bleaching bath                                                    | N II    | 6                | 20±0.5   | 3    | 24±0.5       | 120 7 films<br>35 mm 6 films<br>4 × 5 in. 30 sheets                         | 3 months     |
| Second wash                                                       | —       | 6                | 14—20    | —    | —            | — —                                                                         | —            |
| Fixing bath                                                       | N III   | 6                | 20± 1    | 4    | 18—24        | 120 7 films<br>35 mm 6 films                                                | 3 months     |
| Final wash                                                        | —       | 10               | 14—20    | 5    | 22—24        | — —                                                                         | —            |
| Wetting agent Agfa Agepon 0.5%                                    | —       | 1                | 20±      | 1    | not critical | — —                                                                         | —            |

### Remarks:

1. The developing time is also dependent on the intensity of the agitation to which the film is subjected: the time may be varied, if desired, within a range of 7 to 9 minutes in compliance with the results of sensitometric tests.
2. On making up the intermediate bath 30 ml film developer (about 1.05 fluid ounce), resp., 20 ml regenerator (about 0.7 fl. oz.), "film regenerator S", should be added to each litre of solution. To synchronize with the cycle of hanger-type processors, duration of the intermediate bath may be selected between 3 to 5 minutes.
3. The first wash may be extended to 20 minutes.

Only Agfacolor chemistry should be used for the developing and regeneration in order to ensure optimum results.

In tanks and continuous processors the appropriate amount of regenerator must be added in order to maintain consistency of results.

### Response of Agfacolor 80 S to deviations from standard processing

According to research work carried out so far, deviations in processing seem to have a less pronounced effect on the sensitometric characteristics of Agfachrome 80 S than on CNS with the possible exception of yellow fogging. Reduced nitrogen agitation or circulation of the developer result in a noticeable deterioration of sensitivity and gamma, especially in the yellow layer.

In the case of tanks and hanger-type processors the duration in the bleaching bath is not critical provided it falls between 4 to 8 minutes.

### Keeping properties and storage

**Unexposed film:** storage at a temperature of 2 to +10 °C is necessary. If stored in refrigerators at below -10 °C, stability of the photographic properties can be guaranteed for a longer period of time. Films taken from cold storage should be left at room temperature for two hours before opening.

**Exposed films:** these should be processed as soon as possible after exposure, since keeping them for any further period of time—especially under unfavourable climatic conditions, can have an adverse effect on colour balance.

**Photography in the tropics:** Agfacolor professional films are suitable for use in tropical regions provided the precautions described in a special Agfa-Gevaert brochure on this subject are observed.

**Our assessment** (camera used: 5 × 7 in. Linhof Technika and Linhof 220 RS):

**Colour rendition:** neutral to brilliant. Provided the exposure and processing instructions of the manufacturer are followed, the filtration of Agfacolor 80 S is very easy. Yellow tends to be slightly blackened, yet this is without any great significance in view of the otherwise excellent overall colour reproduction. Generally, one can say that colour fidelity is much better than is the case with CNS. Grey and skin tones are either semi-neutral or pleasantly balanced.

**Sharpness:** very good. Edge unsharpness, a critical point in all colour negative films, has been reduced to a minimum resulting in improved colour separation. The contrast can be influenced to a certain extent, but sharpness remains subject to strict observance of the stipulated chemical processing. If the film is developed in chemical solutions other than those produced by Agfa, the film loses many of its advantages. Filtration then becomes extremely complicated. When Agfacolor 80 S is developed in Neofin Color, it "appears" to be even sharper, but the colours "go haywire".

**General assessment:** a very good film which meets the exacting needs of commercial photography.

*The Editor*

Test-Pictures: Dag Kempe, Foto International, Munich, on Agfacolor 80 S Professional.



# PROBLEMS IN TELEVISION ENGINEERING

## The principle of the flying-spot scanner in television

In this form of video recording, a small spot of light, which has been produced on the display of a cathode-ray tube is sharply projected via a lens through the original (e. g. a colour transparency) on to a photo cell which converts the light into electric current known as the video signal.

Magnetic deflection circuits move this spot over a raster on the screen in such a way that an entire transparency is "scanned". In clear areas of the transparency much light is permitted to pass, the photo cell registering this by larger amounts of current. When the spot meets the dark portions of the transparency only a small current is received. In this manner the varying density of the original is converted into corresponding variations in current of the video signal.

## Transparency and episcopic scanning

The flying-spot scanner is used, above all, for transmitting films and transparencies for television broadcasting. Some studios are also fitted with equipment for scanning reflection copy (opaque paper prints) by the same method. With such a TV episcopic one can transmit text, postcards or art prints without using a more complicated and more expensive television camera. In the case of such episcopic flying-spot scanners, the light diffusely reflected from the print is usually evaluated by several large photo cells in order to record as large a portion of this light as possible.

## Pros and cons of the flying-spot scanner

This method of scanning is the simplest way of recording an image for television purposes. Consequently, the electronics industry has been able to design moderately priced apparatus based on this principle which are simple to operate, robust and reliable. The advantages of this method are:

high resolution and sharpness, constant gradation (the transmission characteristic curve corresponds, independent of the motif, to a photographic gamma of 1), constant value for picture black, undistorted and easily controlled image geometry (the raster can be directly observed), low operating cost due to the fact that scanning and light amplification take place in separate components and can be exchanged independent of each other. Furthermore, the scanning tube is less complicated and, assuming same number of service hours and same image quality, is cheaper than a camera tube.

The main disadvantage of the method is that the "flying spot" must scan the original in complete darkness so that the photo cell only receives light from the flying spot. Any extraneous light has an adverse effect on the transmission. It is therefore obvious that the method is not suitable for location work or recording studio scenes in which illumination effects are important. Naturally, this is of no consequence in scanning transparencies or film strip.

## Scanning in colour television

In those countries in which the transmission standard is based on 625 lines and 25 pictures per second, colour films and transparencies are transmitted almost exclusively via the

flying-spot system. In colour TV this principle has, namely, a decisive advantage over TV cameras: the scanning for the three primary colours is combined and only *behind* the slide or film is the light broken down into its three components by means of dichroic mirrors. The problem of exact raster alignment, which plays an important role in television cameras, is therefore of no significance in flying-spot scanning.

## The requirements placed on the scanning tube, the lens and the photo cell

The type of cathode ray tube employed corresponds, essentially, to that used in television receivers. The flying-spot scanner requires a tube with high, uniform luminance of fine grain, low halation, excellent point sharpness and good "geometry" of the raster, as well as brief afterglow. Whereas in conventional TV tubes long afterglow duration is desirable (because the pictures tend to flicker less) afterglow is very detrimental to the image in scanning, because long white smears appear at the edges of the picture in a right-hand direction. The lens should have a high initial aperture and the photo cell must possess high sensitivity and respond rapidly.

## Scanning film with fast pull-down or with continuous film advance

In the optical projection of motion picture film employing, for example, a Geneva-stop mechanism, there is adequate time to allow for advance of the film. In the case of television, however, evaluation of each frame takes place throughout the entire duration of the visible part of the video raster. For the advance of a film there only remains the "dead" time during which the electronic ray returns to the top of the picture (the so-called "vertical blanking pulse" which lasts only a millisecond). In recent years it has been possible to design for 16 mm movie cameras, the type of rapid-acting pneumatic film advance mechanism which is capable of transporting the film within this very short period.

The scanning of 35 mm film is generally carried out whilst the film is being continuously transported. One utilizes, for the scanning, the vertical movement of the film in such a way that the raster on the scanning screen is only half as high as in the normal case (format on the scanning tube is 8:3 instead of 4:3). For both halves of the image of a full TV picture, one employs a separate optical path (so-called double lens system). Although this method calls for a very high degree of mechanical precision, it has proved its worth in studio practice. However, it is only possible to use elements of relatively low initial aperture for the double lens system, resulting in a certain loss in sensitivity. Since the efficiency of a system increases with the film format being scanned—due to geometric-optical laws—the amount falling on the 35 mm original is, assuming same lens relative aperture and same cathode ray tube, four times as great as in the case of 16 mm gauge film—the loss of sensitivity mentioned can be accepted.

## Principles of image reproduction in colour television Additive colour mixing

The reproduction of a TV colour picture is based on the additive mixture of the three primary colours red, green and blue. As is known from the "additive colour triangle" common to colour photography, it is possible to mix, from these three primary colours, practically all hues and shades of colour

A nude study taken by Paul Genest, Paris. Linhof 220, Agfacolour Professional S, 1/250 sec. at f 11, studio electronic flash.











saturation we perceive in nature. The corners of the colour triangle correspond to the three primary colours; in the centre of the triangle lies the so-called "white point". Through combination within this triangle it is possible to realize any kind of colour image for TV transmission. The less saturated the colour is, the less the distance from the "white point".

#### **The principle of the shadow mask tube**

The only type of colour TV tube which is at present being manufactured in large series is the shadow mask tube introduced in the United States in 1950. Its display screen consists of 400,000 red, green and blue fluorescent dots. They are arranged in such a way that a red, green and blue dot make up an equal-sided triangular cluster. Instead of the single-ray emitting system of a black-and-white picture tube, the colour picture tube incorporates a triple electron gun.

The principle of the shadow mask tube is based on a metal mask with 400,000 apertures which is located in front of the screen and ensures that the ray from one of the electronic guns strikes the phosphor dot of only a single primary colour. One achieves this by aligning the electron guns in such a way that they are not parallel but exhibit a slight angle of inclination relative to one another, with the result that they intersect as they pass through one aperture of the mask, divert again on the other side and, so, may impinge on only a single phosphor dot. The electronic beams thus converge in the shadow mask, and exact convergence is an important criterion for the quality of a colour television picture.

The individual dots on the screen are a mere 0.4 mm in diameter and are, hence, too small to be resolved when looking at the screen at normal viewing distance; the colours of the individual adjacent dots are blended together to give a uniform, composite colour impression which can be varied in hue and intensity by controlling the current fed to the three electron guns.

#### **The essential stages in the manufacture of shadow mask colour television tubes**

The shadow mask consists of metal sheet 0.15 mm thick, both sides of which are coated with a highly sensitive photographic emulsion. With the aid of an appropriate template, the pattern of the 400,000 perforations is projected on to the mask from both sides, which has the effect that wherever light spots fall, the emulsion disintegrates. When acid is sprayed on to both sides of the mask, holes are etched in the metal.

The so-called face plate is first of all coated with a suspension which, apart from the green component, also incorporates a light-sensitive substance. After it has dried, this layer is exposed, through the shadow mask, to a point-source light which is positioned in such a way that the rays emitted from the latter pass through the mask at the same angle as the electron ray for green will do in the future. During this process the phosphor dots for green are hardened to such an extent that they still adhere to the glass when the suspension is washed out. In the same manner the phosphor dots for blue and red are now also located on the inner surface of the face plate. It is, of course, important that the same shadow mask always be used for a particular face plate. Only in this fashion can one be certain that alignment errors, due to minute, unavoidable differences between the individual masks, are eliminated.

Photo by Studio Baumann, Germany.

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**PHOTOS 7**

## The unsharp foreground

by Dr. Arthur Gewehr

In the fields of painting and commercial art it is usual to find the whole motif is sharp from foreground to background. Otherwise, it is mostly the background which is left unsharp. The Stuttgart photographer Franz Lazi has often incorporated an unsharp foreground in his work and the result has been convincing in most cases. On the whole, however, the possibilities of an unsharp foreground have received little attention, although in colour photography very attractive effects can be achieved. A really unsharp foreground can only be obtained with genuine long-focal-length lenses. At the extreme end of the format scale, that would mean a 60-cm copying lens for the 8 x 10 in. format. Such lenses have been supplied in shutters by Schneider and Rodenstock for quite a number of years and the necessary investment is not very great.

The next question to decide is whether the foreground, which we wish to leave unsharp, should be part of nature or consist of a prop made by the photographer. The best solution will depend on what is available on location, but one should give serious consideration to a constructed foreground, because this affords greater freedom and can be more easily manipulated.

There are several ways of treating the foreground: flash may be used to fill in well-saturated colours in the foreground or coloured foil may be placed in front of the flash. An example is an illustration of a pale grey plaster figure: instead of flooding the figure in wine red—which would have been too "sweet"—the photographer employed only a touch of colour.

A soft-focus lens is a useful aid when one wishes to soften the contrast between a totally unsharp foreground and a sharp background. However, it is generally preferable to use normal anastigmat lenses, since it is the very contrast between sharp and unsharp planes which lends the picture its impact. Subjects incorporating an unsharp foreground are, furthermore, suitable for the introduction of a little abstract colouration. In the case of reversal film it is suggested that one tries the Kodak CC filters in the densities 30, 40 and 50. A test series may be necessary in order to predict the final results, unless the photographer has already gathered experience with high filter densities in some other field.

The technique of the unsharp foreground is more than a mere "off-beat" form of representation. In combination with controlled beams of colour directed at the foreground, general flash fill-in with interposed coloured gels and manipulated filtration it is possible to realize certain preconceived visual ideas.

A point of technical importance concerns camera shake: when working with lenses of around 60 cm focal length, it is recommended that the camera be set up on two tripods so that it is steady enough to resist movement by wind. In large-format tele-photography with lenses of around 100 cm in focal length, this became a matter of practice after Feininger disclosed this method in one of his books. Some optical bench cameras have provision on the monorail for a second tripod support; otherwise, information about combining two tripods can be obtained from a number of camera manufacturers. The beauty of the soft foreground is best retained in print by photo-gravure (intaglio). Even for smaller quantities there are ways of obtaining moderately priced prints from plates. Those interested should write to the firm Ernst Giesecking, D-4813 Bethel-Biefeld, Postfach 24.

Photo: Uwe Behrendt, Frankfurt.







## EXPERIMENTAL EXPERIENCE

### The opal globe and the illumination of small objects

by Dr. A. Gewehr

The illumination of small objects such as jewellery and industrial components has always caused the photographer a good deal of trouble. Direct illumination is out of the question, because irritating highlights and shadows occur, distorting the appearance of the object. Indirect illumination is theoretically possible, but it is difficult in practice to arrange light coming from below a small light tent. The most ideal form of diffusing globe is an opal sphere at which white or coloured light may be directed from outside. The globe should be propped up on a stand so that it can be illuminated from any direction—i.e. obliquely from below.

Such opal globes can be obtained from most lamp shops or dealers in electrical lighting fixtures. One should select a globe which has a diameter of about 10 in./25 cm. It facilitates handling if a segment is cut off the top of the globe to provide an aperture for the camera lens. The use of a copying lens for a 4 × 5 in. camera has two advantages: the hole for the lens need only be 25 mm large and the curved surface of the globe remains practically intact. Such process/macro lenses are corrected for scales of reproduction such as occur in the present instance; absolute sharpness is therefore maintained.

Exposure measurement presents no problem if one employs the modern method of taking a reading on a focusing screen. As in the case of all small objects, it is recommended to support them on a thin rod from below in order to keep the object clear of the base or background. The ground will then appear unsharp, thus avoiding any structure which would spoil the composition. The described technique has been used by experts in the macro/micro fields for many years.

As desired, the light falling on the object inside the globe is very soft and diffused. According to the results required, it may prove necessary to increase the gamma values of the negative slightly. In the case of black-and-white photography this is achieved through giving a shortened exposure and developing for a longer time than standard. Colour negative film must be handled according to the manufacturer's instructions, although it is usually possible to employ slightly more concentrated developing baths and to shorten the exposure appropriately. After a few trial runs one is soon certain what sort of manipulations are necessary to obtain the desired gamma increase on black-and-white and colour negative film.

When working with colour reversal stock it is most likely that an increase in gamma will be neither necessary nor desirable. Colour transparency film usually responds favourably to soft illumination.

Lighting of the opal globe is best carried out with tungsten lamps. Such globes are perfectly capable of withstanding heat and, in their normal function, usually have to do so without any ventilation. Yet, it is recommended to warm up the globe on all sides by moving the lamps progressively closer. A fracture is thus avoided which, if it does occur at all, usually takes place just when the shops have closed.

In the case of diffused illumination, such as provided by the opal globe, it is important to avoid scattered light. One precaution is to use a lens shade made of rubber which serves, at the same time, as a flexible connection between the camera lens and the globe. When the lens is shielded in this way it is even possible to arrange a lamp so that light comes from the top edge of the globe.

### Data on the soft-focus effect

by Dr. A. Gewehr

The soft-focus lens was developed during the period of artistic impressionism. Photographic soft focus and impressionistic representation go hand in hand today. The soft-focus effect is used in advertising, in situations where the general form and colour composition are more important than sharp detail. The fact that the soft-focus lens has played a minor role in the field of advertising is due to inappropriate use or sheer failures. The aim of these comments is to help avoid such pitfalls.

To achieve this kind of diffused impression, the advertising photographer requires a lens or attachment which combines full depth of field with the soft-focus effect. He must be able to stop down to f 22 without completely losing the softness. Since the "1974 photokina" the firm Martin Summer, D-8032 Gräfelting, Drosselgasse 4, can supply "Softare" to fit lens mount diameters commonly used by commercial photographers. These Softare are glass discs with dot-like cavities and are available in various grades of softness bearing the designations I, II and III. The individual attachments can also be mounted in pairs on the lens.

An important factor in soft-focus photography is the necessity to keep the exposure short. Even slight over-exposure just produces a "blurred mess". With a no-more-than-adequate exposure and "pushed" development the rendition acquires mellowness and yet remains brilliant in the core. Prolonged development can be undertaken by the majority of custom labs which process reversal film. This enlarges the scope for soft-focus photography no matter whether one prefers to work with black-and-white, colour negatives or colour reversal stock.

The attempt to transfer the "diffusing" to the darkroom is a mis-

take; one merely obtains the very opposite effect, because there is no irradiation spreading into the shadows. On the contrary: the blackening merges into the highlights. The final result is dull and completely lacks the vaporous, sunny atmosphere. The enlargement of a normally-sharp negative by means of a soft-focus attachment is, perhaps, an exception.

It can be used for motifs where large bright areas are to be filled up with irradiated grey or colour. At this stage one has already arrived at the fringe of experimental photography.

Since the aim of soft-focus photography is not a straightforward, matter of fact representation, one is free to manipulate the filtration and obtain abstract colour effects. This also applies to the use of colour reversal film such as Ektachrome where surprising results may be obtained with CC filters in the densities 30, 40 and even 50.

The best kind of paper for reproducing the soft-focus effect is Zanders Chromolux. This coated art paper is ideal for rendering the "sunny" impression. Single colour prints of a self-willed, striking nature may be obtained by using Chromolux metallic papers.

The beauty of a soft-focus photograph can be demonstrated most convincingly by placing, by way of contrast, a needle-sharp picture adjacent to the latter. This is something worth considering at the layout stage. The author is reminded in this context of a travel advertisement he saw a few years ago: the filmy impression of a baroque castle in soft focus contrasted with a wrought-iron door-knocker taken with a Tessara at optimum aperture.



# STUDIOS OF THE WORLD

Jens Witthaus studios





# Jens Witthaus studios

This undertaking really deserves the title "Studios". On a working space of 3000 square metres/3588 sq. yards, interiors, advertising and fashion photography takes place. In June this year Dieter Pohlschröder overtook the management of the firm and we asked him how he viewed the future prospects for a large-scale studio.

*Editor:* What kind of work do your studios cover? Do you accept every form of commercial photography or have you specialized?

*Pohlschröder:* We have, of course, specialized to a certain extent. The market demands this anyhow. If you take a look through samples of our work, you will notice that assignments from furniture manufacturers and fashion houses make up a large percentage. Our technical facilities have proved unusually interesting to the furniture industry. One studio alone has an area of over 950 sq. yds. Another decisive factor in winning clients in this field is the fact that we have our own joinery and assembly workshops—this is very important in interior photog-

raphy. For fashion photography we have a separate studio specially designed for this purpose. This section includes changing rooms, make-up facilities and the necessary technical props.

*Ed.:* Could one say, therefore, that you are a specialist for furniture and fashion?

*Po.:* No, that is not really true, although in recent years there has been a tendency in this direction. We would not like to regard ourselves as working solely in these two fields. Our technical equipment, as well as the qualifications of our photographers, afford us a much greater scope than just these two sectors. We believe we are just as capable of handling, for example, photography for the automobile industry, machine tool manufacturers as well as still-life and product photography.

We even have plans in the movie film sector, for example, advertising films or short documentaries. This is a matter, however, for the future.

*Ed.:* What, as a matter of fact, are your future plans?

*Po.:* First of all, we intend offering our clients a wide variety of services at keenly calculated prices. This we believe is necessary in order to remain competitive on the market and to prove to the clients that quality photographic work can also be combined with realistic prices. We must be prepared, in the very first place, to go along with ideas that are "right off the beat".

Our offer is a three-stage one. If a client desires, we can put our studio space and technical facilities at his disposal and he can either bring along his own house photographer or give the assignment to an outside man. The second stage includes availability of the studios, the technical equipment as well as the services of one of our own photographers. Of course, directions remain in the hands of the client.

The third kind of contract we offer comprises the entire complex of pictorial advertising ranging from conception, art buying, styling, to execution of the photography. In such a case these clients merely outline the concept and we carry out the entire assignment ourselves.

We believe this differential offer will prove of interest to many clients, since



Page 63: The studio. Colour pages: a few pictures of the Studio-Team.

Page 64: Laboratory and Studio (a picture is being prepared).

All photos: Jens Witthaus-Studios, Germany.









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## STUDIOS OF THE WORLD: JENS WITTHAUS STUDIOS

they are not obliged to bear the overall costs of the studio but only pay for the actual services they use.

*Ed.:* We have also heard that the Jens Witthaus Studios also run a large and efficient laboratory.

*Po.:* It is true that in the past these two undertakings, that is, the photo studios and the laboratories, were very closely connected. However, we have realized in the meantime that this is not the best solution for the future. This was the reason why we originally decided to strictly separate the two departments. The only laboratory attached to the studio now is the test lab from which our clients can obtain proofs only two hours after shooting in the studio. Of course, our large laboratories are at the disposal

of our studio clients and vice versa, but this takes place at another level of communication. This separation ensures a more accurate calculation of the individual costs, and this means a more realistic price for all our clients.

*Ed.:* You can imagine that we are interested to know for whom you work.

*Po.:* That is understandable, but it is not really in the interest of our house or of our clients to make it publicly known for whom we work. This has become a point of great discretion in publicity. If we were to offer such information, we might have difficulty in obtaining new clients. I can, however, tell you that we work for leading furniture manufacturers, fashion houses, architects, breweries, and the manufacturers of various other

industrial and consumer goods. We also have a good clientèle of advertising agencies, some of which commission us with the execution of entire advertising campaigns.

*Ed.:* You mentioned previously the excellent technical equipment in your studios. Could you possibly tell us what kind of equipment you employ for typical assignments?

*Po.:* Our technical equipment includes complete camera outfits from 35 mm up to 8 × 10 in.—including a wide range of appropriate lenses—as well as modern artificial lighting banks and flash equipment with a total output of 100,000 ws. The studio is also fitted with two travelling gantries which spread over the entire width of the studio.



# ***Colour temperature measurement is not enough***

by Josef Scheibel DGPh

It has been claimed by a number of writers in this, and other photographic journals, that there is little point in taking a colour temperature measurement in all those instances where the light source is suspected of not having a continuous spectrum. One is thinking, in this respect, principally of fluorescent tubes, sodium vapour and mercury vapour lamps. There is little justification in simply leaving matters at that and I feel some further comment is called for. In actual fact the still photographer or movie cameraman is very often confronted today with the discontinuous spectrum of discharge lamps. With the aid of modern measuring instruments it is not all that difficult to solve the inherent problems of measurement and filtration. It has proved necessary to use a three-colour analysis which, naturally, cannot be carried out by employing the simple principle of two selenium cells covered up by revolving filters. In the Minolta "Color Meter" the evaluation of the test current is effected with the aid of three silicon photocells so that all filter data can be read off directly. Apart from the colour temperature — expressed in degrees Kelvin — the scale indicates, after pre-setting the type of film in use, the conversion filtration in decamired on blue and reddish scale bands. If a discontinuous spectrum is suspected in the motif, the red-green relationship must also be determined. The measured values from 1 to 11 on the magenta or green scales are to be found entered in a table on the rear side of the apparatus housing with the appropriate Agfa-Gevaert AK and Kodak CC filters. A direct read-out of this additional correction filter is not possible, since the filter systems employed by Agfa-Gevaert and Kodak differ. In the technical literature of previous years colour analysers which function according to the quotient principle were often criticized as having too low a sensitivity to light. The Minolta "Color Meter" goes to the other extreme and permits colour readings to be taken, with full accuracy, when the light is as low as 100 lux. Of course, the apparatus guarantees reliable measurements within a wide temperature range (from  $-10$  to  $+50^{\circ}\text{C}.$ ) and, due to the special silicon photo-elements as well as novel circuitry, permits colour analysis independent of the light intensity and without any proportionality deviation. This is not, however, the correct place for a detailed description of the apparatus and interested readers are recommended to ask the manufacturer for a comprehensive specification. The intention is, rather, to draw attention to a comparison between a straightforward measurement of the colour temperature and the three-colour analysis and, hence, to an easy way of arriving at simple and exact filter data.

## **A measurement example**

Subject: a factory hall the interior of which is illuminated entirely by fluorescent tubes; no additional lighting is

possible. The colour film is balanced for  $5500^{\circ}\text{Kelvin}$ . 1. Colour temperature measurement. The colour meter is aimed, just as in normal photographic light measurement, at the subject from the camera position. Press the button, wait until the pointer is stationary, and release it again. If the pointer strikes the left or right-hand limits, switch over to the  $4\times$  measuring range (this affords four times the scale length for increased accuracy) and observe that the pointer is now free to swing. Follow up with the red scale mark and read off the colour temperature in degrees Kelvin (e.g.  $3700^{\circ}\text{K}.$ ) respectively, the decamired interval 9 on the blue scale (= conversion filter B 9).

2. Since the presence of fluorescent/neon illumination causes one to suspect a discontinuous spectrum, one should now carry out an analysis for the third colour, namely, the red-green balance. For this purpose the colour meter is switched over and measurement repeated. After transferring the differential value, one can read off the relative figure 2.7 from the magenta scale. As the table on the rear of the apparatus indicates, this measured value is roughly covered by the Agfa-Gevaert correction filter 15, resp., Kodak CC 10 M. From the scales of the colour meter it is now possible to read off all the required filter data. Employing a conversion filter B 9 plus a CC 10 M (or AK 15) one can be sure of obtaining a photograph free of colour cast. The "Color Meter" is so designed that it is not possible for neutral densities to occur. It is therefore not necessary to subject the filter values obtained in this way to any further corrections or adjustments. If one desires to check the filter pack and/or the accuracy of the measurement itself, one merely has to lay the filter pack on the measuring probe and re-measure compensatively, whereupon one should arrive once again, without any additional filter manipulation, at the original value set for the type of colour film in use.

The somewhat lengthy description of the measuring procedure might give the reader the impression that the three-colour analysis is complicated and time-consuming. This is, however, not the case. In problematical situations the measurement does take, of course, somewhat longer than the customary 30 seconds required and, anyhow, photography in such circumstances has probably little chance of success without a thorough three-colour analysis.

In conclusion it should be pointed out that a three-colour analysis is not only necessary in the case of subjects illuminated by discharge lamps but in many other instances as well, e.g. reflection onto the motif from a brightly coloured background, heat-absorbing filters in front of lamps, umbrella reflectors and other reflectors or diffusors which are not absolutely neutral. In all these cases the subject illumination is so "contaminated" that a simple colour temperature measurement with subsequent conversion filter correction will no longer lead to the desired result.



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## Quiz

The author of this shot, J. R. Cook of Dublin, gave it the title "the sound barrier". Is it really possible to depict a sound barrier in pictorial terms? What has actually happened here?

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### The solution to the Quiz in IPT 3/75

The Photographer Werner Kaletsch of Nuremberg set up the globe in the foreground and placed the model at a greater distance behind it. There remained the task of aligning model and bulb exactly along the optical axis which, when accomplished, gave this effect.

### The winners:

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